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## INVESTMENT, PRICES, BUDGET AND FINANCE

### ACTIVITIES, RULINGS OF USSR STATE PRICE COMMITTEE ANNOUNCED

#### New Price Regulation

Moscow EKONOMICHESKAYA GAZETA in Russian No 10, Mar 82 p 7

[Unattributed article: "A New Regulation"]

[Text] The USSR Goskomtsen [State Committee for Prices] has approved a Regulation on the Procedure for Employing the Normed Parametric Method of Setting Wholesale Prices and Net Product Rates for Glass Lighting Articles Manufactured Under New Technical Conditions Not Included in Section Four and Nine of Price List No 06-02 1980 Part I "Wholesale Prices For Glass Articles."

The designated prices are calculated by the production associations (enterprises) and are approved with the consumer simultaneously with the technical conditions. For this a special appendix is to be drawn up and it must give deviations in the quality requirements in comparison with the analog and provide a price calculation. This appendix is to be signed by the supplier and the consumer and the correctness of the price calculation should be confirmed by the Union republic ministry of the building materials industry of which the given production association (enterprise) is part.

#### Reductions in Limit Prices

Moscow EKONOMICHESKAYA GAZETA in Russian No 19, May 82 p 7

[Unattributed article: "At the USSR Goskomtsen"]

[Text] A study of the practice of recording limit prices with the USSR Goskomtsen as shown that there is a number of shortcomings in this work. In 1981, 257 draft limit prices were received for registration for products of the machine tool building, electrical engineering, instrument building industries and chemical machine building. Of them, 58 drafts were returned without registration due to incomplete materials for verifying the calculation for the economic effect and the limit price level as well as for the reason of exceeding production expenditures over the planned price and the low productivity of metalcutting and foundry equipment.

Of the 199 registered limit prices, 64 percent were altered by a reduction of from 2 to 86 percent in comparison with their amounts in the drafts. For example, for the abrasive-planetary machine (type 3391) the limit price was reduced from 10,184 to



4,500 rubles, for the vertical drilling machine from 6,580 to 1,460 rubles, and for the universal tool drilling machine (type 67K12BP) from 11,340 to 6,240 rubles.

The basic reason for the overstating of the limit prices, as the checks showed, is that they were calculated in deviating from the procedural provisions of the normative and technical specifications.

The USSR Goskomtsen has forwarded the appropriate materials to the industrial ministries to adopt measures which would exclude the unjustified overstating of limit prices.

#### Regulations for Chemical Packaging

Moscow EKONOMICHESKAYA GAZETA in Russian No 21, May 82 p 10

[Unattributed article: "An Explanation on Payment of Services"]

[Text] Upon the request of readers, the USSR Goskomtsen explains that payment for services rendered by supply-marketing organizations to consumers in bottling liquid chemical products should be carried out in the following procedure:

1. The wholesale prices for liquid chemical products consider expenditures on pouring it into all types of tanks. The suppliers (manufacturing enterprises and supply-marketing organizations) for this product should not charge any extra to cover the designated expenditures above the established wholesale prices and the supply-marketing surcharges.
2. The expenditures of the manufacturing enterprises for pouring liquid chemical products into bottles, Dewar vessels, containers, barrels, drums, flasks and canisters are not included in the wholesale prices for the liquid chemical products and are paid for by the purchasers (consumers and supply-marketing organizations) above the wholesale prices in accord with the general instructions for the price lists for chemical industry products.
3. If the supply and marketing organization has paid the manufacturing enterprise for the cost of pouring the liquid chemical products into packaging above the wholesale price, in accord with the general instructions for the price lists, then in distributing the products to the consumer in the same packaging the supply and marketing organization collects from the consumer the cost of bottling paid to the supplier above the wholesale prices and the set surcharges in accord with the price lists.
4. In those instances when the supply and marketing organization, at the consumer's request, itself bottles the product in small packaging, that is, provides a service in packaging the quantity of allocated liquid chemical products, payment for this service should be made above the wholesale prices and warehouse surcharges according to a calculated cost for this work approved by the supply and marketing organization with the consumer and with a profitability of not more than 15 percent (in terms of the cost of the work).

5. In accord with the Regulation Governing the Delivery of Production and Technical Products, the supply and marketing depots of the ministries, state committees and departments dispatch (release) products in any quantity needed by the recipient below the minimum shipping amounts. For this reason the single filling of bottles, containers, barrels, drums, flasks, canisters and so forth with a liquid chemical product in the necessary amount allocated to a recipient is not an additional service for the supply and marketing organization and should not be paid for above the surcharges.

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## INVESTMENT, PRICES, BUDGET AND FINANCE

### ROLE OF PRICES AS MEASURE OF VALUE EXAMINED

Moscow DEN'GI I KREDIT in Russian No 3, Mar 82 pp 40-45

[Article by A. S. Gal'chinskiy: "The Function of the Measure of Value and the Scale of Prices: Their Unity and Contradictoriness"]

[Text] In the Marxist theory of monetary relationships, the function of the measure of values is the basic and initial function determining the social role of money and its use as a universal equivalent. The main purpose of the designated function is to provide a material for the commodity world to express the value of the commodities. For precisely this reason, wrote K. Marx, all commodities, as value, represent a qualitatively uniform abstract labor and, consequently, in and of themselves are commensurable, and they can all measure their values by the same specific commodity, thereby converting this latter into a measure of value common to them.

In examining the mechanism involved in realizing the function of a measure of value, K. Marx proved scientifically that in the price formation process a change in the value of a monetary commodity has a real impact only on the prices of those commodities which are directly exchanged for precious metal in the process of metamorphosis G--C (gold--commodity) carried out in places where gold is mined. As for the co-measuring of the value of a monetary commodity and the aggregate commodity bulk on a scale of world production, this is done "to the degree that one commodity infects the other." Since the proportional amount of gold mining in aggregate world production is insignificant, its immediate impact on the dynamics of prices for the commodity market is virtually unfelt. In this sense, the functional role of the measure of value is manifested not in regulating the relative amount of the values of the mass of commodities but rather in providing for the commodity world a value standard through the price scale on the basis of which various values in the process of exchange are equalized.

Considering this a fundamental question characterizing one of the initial principles in realizing the function of a measure of value is the thesis thoroughly established by K. Marx on the dialectical unity and opposition of the measure of value and the price scale.

The organic link of these categories is determined by their involvement in the price formation process where "gold," as K. Marx emphasized, "is turned from a measure of values into a price scale." At the same time K. Marx did not absolutize their unity. He focused attention on the fact that as a measure of value and as a scale of prices,

money performs completely different functions which are realized on various levels of the price formation process. Money in the designated definitions expresses the different nature of the relationships: "As a measure of value, commodities are measured as values; on the contrary, the price scale measures various quantities of gold by its given quantity and not the value of the given quantity of gold by the weight of its other quantities."<sup>1</sup>

The methodological basis for elucidating the specific features of money as a measure of value and as a price scale is a delimitation of the two levels of the circulation process: the preparatory stage and actual circulation.<sup>2</sup> Correspondingly, the process of the growth of the measure of value into the price scale through which the monetary commodity participates in price formation, in realizing its initial function, on a general methodological level can also be represented in the form of a two-tiered system which includes: 1) the ideal conversion of the product of labor into value, that is, the mental ascribing of a commodity form to it and 2) the nominal expression of the commodity's value.<sup>3</sup>

As is known, a product of labor, as the result of production per se, still is not directly an exchange value. The primary relation on the path of converting it into a commodity is its ideal equating to money as the social embodiment of universal abstract labor and the ascribing to it, as K. Marx expressed it, "an initial commodity form."<sup>4</sup> Thus, a product of labor as a commodity, in order for it to acquire an economic quality and become an exchange value should first be turned into universal working time, that is, into something qualitatively distinct from it. It should be turned into a uniform socially universal materialization of human labor devoid of differences.<sup>5</sup> The result of this relation carried out on the basis of the function of the measure of values is an ideal expression in gold of the commodities' relative value and the ascribing "to their value a form of price for mentally imagined gold" by which the social substance of a product of labor is manifested. Such a price (called by K. Marx "a price as an ideal form for the expression of a commodity's value," "a price as a property of commodities" or "a gold price"), as a value generally, does not have a physical expression. In characterizing the social property of a commodity, it can not figure into the bookkeeping entries or the commodity markets. It expresses the relation of the products of labor and a monetary commodity as values where gold operates ideally, as the representative of universal working time. "A price or the monetary form of commodities," wrote K. Marx on this question, "like their value form generally, is something distinct from their sensorily perceived real corporeal form, and consequently, only an ideal form existing only in imagination."<sup>6</sup>

The price scale expresses a fundamentally different relationship. Here we are confronted with the purely technical function of money. Money in the given role operates in its material-physical form. It becomes, in the expression of K. Marx, "accounting money." Through the price scale there is a secondary, again ideal equating of products of labor and gold as a monetary commodity. However here the parties operate in a new quality: there is the relation of gold already mentally embodied previously in the price as an ideal determination of the exchange value of a commodity and gold, but not as a materialized universal working time but as a unit of weight for a natural material. "As the scale of prices," wrote K. Marx on this question, "money, in turn, already presupposes the conversion (theoretical) of a

commodity into money.... In order to imagine value as a price, the value of commodities should first be represented as money."<sup>7</sup> Thus, the specific feature of the function of the price scale is that in the given quality the money is correlated not directly to the commodity's value but to its ideal gold price, that is, to a certain quantity of gold which now is mentally embodied in the commodity through the function of the measure of value. By this relationship, the price of a commodity, as an indicator of the amount of its value, is transformed into a quantitatively perceived monetary form, into a listed or retail price,<sup>8</sup> thereby being clothed in a national monetary garb. "...If initially," K. Marx emphasized in a manuscript of 1857-1859, "money expressed exchange value, at present a commodity, as a price, as an ideally conceived and mentally realized exchange value, expresses a certain amount of money."<sup>9</sup>

As a result, the participation of the measure of value and the price scale in the price formation process can be expressed by the ratio  $Zl--Pg--Pn$  (the product of labor--gold price--nominal price) and this is the equivalent of  $Zl--Mv--Sp$  (the product of labor--the measure of value--the price scale), where as  $Pz$  the commodities are represented as values; as  $Pn$ --as representatives of money.<sup>10</sup> A fundamentally important aspect of the given relationship is that "the exchange values of commodities are converted into prices, into quantities of gold before the gold develops into a price scale."<sup>11</sup> This, in the first place, determines the place of the function of the measure of value in the price formation process. It is not only a question of the  $Zl--Pg$  process. Here there is not and cannot be the embodiment of the product of labor in the nominal price or the ratio  $Zl--Pn$ . K. Marx on this question wrote that gold becomes a measure of value only because all the commodities assess their value in it. In this regard money, as a measure of value, is a "symbolic universal product of working time"; money is "not a separate commodity but rather the symbol of a commodity" which has universal recognition and therefore is a social symbol.<sup>12</sup>

Secondly, the ratio  $Zl--Pg--Pn$  defines the place of the "gold price" of commodities in the price formation process and its objectively determined nature. The "gold price" or the "price as an ideal form of expressing value," as an economic category expresses the imminent relationship of commodity circulation. On its basis the products of labor are related to one another as qualitatively uniform amounts. Outside of it the products of labor and gold as different-quality material substances cannot be converted into one another, as they are incomparable in their physical embodiment. At the same time, the gold price, as an ideal expression of value, is a mental abstraction. It is not the equivalent to the market gold prices which exist under the conditions of the actual circulation of a monetary commodity. While the former is related to the function of the measure of value, the latter is related to the price scale. K. Marx wrote that theoretically they must not be confused, for they express different quality relations. He drew attention to the confusion consisting in the fact that "monetary names simultaneously express both the value of the commodities and a certain portion of the given weight of metal or monetary scale."<sup>13</sup> By the gold price, a product of labor is given, as K. Marx wrote, only the "initial commodity form" which is discarded in the process of the transition from the ideal establishing of a price to the actual establishing of a price. In this sense the gold price, the price as the imminent property of the reality of the commodities and its nominal price relate to one another as content and form; the nominal price operates as the form of expression of the gold price.



Thirdly, since the gold price, in expressing the relation of the products of labor and a monetary commodity as the relation of individual and universal working time, cannot exist outside its specific monetary embodiment, for money is not only universal working time but also the materialized universal working time, the measure of value cannot exist outside the price scale. "In an ideal measure of value," emphasized K. Marx on this question, in describing the relationship of the measure of value and price scale (and not the relationship of the measure of value and the means of circulation, as certain authors assume), "is thus concealed hard cash."<sup>14</sup> As a result, the function of the measure of value objectively presupposes its development in the price scale; it is realized only on the basis of the price scale. "...Once value has been converted into price," wrote F. Engels, "it becomes technically necessary to further develop the measure of value into the price scale; that is, a certain amount of gold is established which measures the various quantities of gold. This is carried out distinctly from the measure of value which depends itself upon the value of gold but which is indifferent for the price scale."<sup>15</sup> This manifests the dialectical unity for the categories of the measure of value and the scale of prices, the erroneous interpretation of which, in the expression of K. Marx, "gives rise to the most absurd theories."

In particular, K. Marx emphasized that the widespread bourgeois notion of an "ideal monetary unit" is based upon a confusion, on the one hand, of the measure of value and the price scale, and on the other, money as a measure of value and as a means of circulation. In scientifically establishing the theoretical invalidity of the given concept which in a most generalized form was represented by J. Stuart Mill, K. Marx wrote: "Not understanding the conversion of the measure of value into the price scale, he (J. Mill--A. G.) naturally assumes that a certain quantity of gold serving as a unit of measure is related as a measure not to other quantities of gold (that is, to the ideal gold price.--A. G.) but rather to values as such. Since commodities, due to the conversion of their exchange values into prices, operate as amounts of the same name, he denies the qualitative feature of the measure which also makes them of the same name; since in this comparison of varying quantities of gold the amount of that quantity of gold which serves as the unit of measure is hypothetical, he denies that this amount should generally be established at all."<sup>16</sup>

Thus, the gold price is an objectively determined structural element and an essential part of the price formation process which expresses the social substance of the labor process. On its basis there occurs the hypothetical, mental conversion of individual working time into the socially necessary. The negation of the gold price on the theoretical level means the elimination of the functional differences between the measure of value and the price scale and their identification. In actuality, if one were to agree with the assertion of certain authors that the product of labor is expressed directly in a certain monetary unit on the basis of the  $Zl--Pn$  ratio, then this unit should be: 1) either directly the reality of working time or 2) an indicator devoid of materiality for just the proportion in which the goods are exchanged. Otherwise the commodity and the money will not be comparable. However, it is not difficult to note that in both the first and second instances there will be an actual negation of the qualitative differences between the price and value of the goods. In actuality, under the conditions of simple commodity circulation, when the difference between these economic categories is actually absent, the converting of the measure of value into the price scale was not necessary. In speaking about this, K. Marx.

wrote: "Money can operate in determining the measure and the universal element of exchange values without being realized in its further determinations (having in mind the price scale.--A. G.).... This is the situation with simple exchange trade. However, in this instance it is assumed that the exchange occurs only rarely, that the commodities have not developed as exchange values and for this reason also as prices."<sup>17</sup> However, since under the conditions of developed commodity relations the price and value, independently of whether or not they coincide, are nominally different in terms of the nature of those relationships which they express, the structural elements through which they are manifested cannot be identical. "Since price does not equal value, the element which determines value--working time--cannot be that element in which prices are expressed, for in this instance working time should be expressed simultaneously as the determining and nondetermining, as the equal and unequal of itself. Since working time, as a measure of value, exists only ideally, it cannot serve as the matter for comparing prices.... The difference between price and value requires that values, as prices, change by another scale and not by their own one."<sup>18</sup> The methodologically vulnerable is the second premise on the possibility of setting  $P_n$  (the nominal price) directly on the basis of the exchange proportions in paper currency and on this basis eliminating the problem of the commodity nature of money. Externally the given premise is not only acceptable but also one which would conform with the views of K. Marx on the price formation process under the conditions of mature capitalist commodity relations.

In actuality, in taking up this problem in a manuscript of 1857-1858, K. Marx wrote that "as merely the existence of commodities as prices has already become a premise... the setting of new prices is a simple matter, since then the elements of production outlays themselves already exist in the form of prices and hence they have merely to be added up."<sup>19</sup> This thesis which is of exceptional interest from the viewpoint of analyzing the present-day price formation process was confirmed also in the first volume of "Capital," where, in examining the questions of the exchangeability of commodities, K. Marx emphasized that "custom fixes them as value amounts."<sup>20</sup> At the same time, in speaking about the proportions on the basis of which the price formation process is carried out, K. Marx at no time deviated from the basic methodological principle which, as was already said, defines the watershed between Marxist and quantitative theories about money, that is, that goods enter into exchange relationships either as a direct buying and selling relationship or in exchange on the basis of a credit transaction, already being garbed in a monetary form. In proving the invalidity of the monetary theory of J. Mill, K. Marx drew attention to the fact that "the values of commodities only become comparable with one another as simple numerical amounts, as quantities of an arbitrarily taken unit of the same name and only express reciprocal proportions when each individual commodity is measured by a commodity that serves as the unit or measure for them." At the same time he emphasized that "only when various things are already assumed to be measured does the unit serving as the measure designate just the proportion between them" and only in this instance "do commodity prices express nothing in addition to those relations according to which the commodities can be exchanged for one another, in addition to those proportions correspondingly to which they are exchanged...."<sup>21</sup> These theses of K. Marx are of fundamental methodological significance in explaining the specific nature of the present-day development of capitalist monies, including the specific features of the present-day mechanism of the price formation process.

In investigating the historical development trends of monetary relations, K. Marx scientifically established the objective causality of the process of their internationalization; this gained its true configuration under the conditions of modern capitalism. Outside a consideration of the entire aggregate of factors which characterize the ongoing development and improvement of this process which is based upon a deepening of the international division of labor, the internationalization of production and the formation of an international value of commodities, an analysis of modern money and the specific features of realizing its function is devoid of an objective basis.<sup>22</sup>

In examining the process of the internationalizing of the system of monetary relations and its development as a single integrated organism in the historical aspect from the standpoint of the relation of the function of the measure of value and the price scale, it is important to draw attention to the fact that the formation of national monetary system even under the conditions of precapitalist production relations was linked to the establishing of price scales by states. Their setting was logically prepared for by the conditions of initial circulation of metal even before the formation of national monies, when the function of the measure of values was expressed spontaneously, by the weight units of the noble metal itself. In describing this process, K. Marx emphasized that the price scale existed in a ready form in the general measures of the weight of metals. For this reason even with the simplest forms of monetary circulation, they [the prices] fulfilled the function of a measure of value. The very fact of the fixing of the price scale by a state meant the legal ascribing of a national character to money and formally excluded the possibility of its direct functioning in the form of a national currency on the world market. "In those various national garbs," wrote K. Marx on this question, "which carry gold and silver as coins and which they again replace, appearing on the world market, a division is manifested between the internal or national sphere of commodity circulation and the universal sphere of the world market."<sup>23</sup>

Subsequently, in the process of the historical development of monetary relations, because of the exchangeability of paper money and the saturating of the channels of circulation with this type of money, the official price scale was subjected to a spontaneous negation. The state was unable to have a controlling influence on it; it lost economic sense and this created the objective prerequisites for its official abolishing. At the same time, the abolishing of the official price scale, in being prepared for by the entire course of the historical development of the monetary system based on the circulation of unchangeable paper money did not eliminate the functional link between the monetary commodity and the notes of value and on this basis the interlink of the function of the measure of value and the price scale.

In examining the facts of the overfilling of the circulation channels with banknotes, K. Marx wrote that seemingly the interference by the state putting out the paper money would destroy the economic laws. The state actually, he emphasized, can throw any amount of paper money into circulation. Divorced from their functional reality, they are turned into valueless pieces of paper. But by this mechanical act state control is halted. The notes of value caught up in circulation fall under the sway of economic laws. K. Marx viewed an abstract instance when 15-fold more banknotes were thrown into circulation than necessary. In this instance, he wrote, "nothing would be changed except the name of the price scale which, naturally, is of a



conditional nature and it is of no importance whether this changes directly by a change in the content of the coinage or indirectly by increasing the amount of paper money in an amount corresponding to the new, lower scale."<sup>24</sup>

Thus, the oversaturating of the channels of monetary circulation with paper money, according to K. Marx, does not lead to its "emancipation" from a monetary commodity. To the degree, he emphasized, that the total amount of the notes of value increases, there is a reduction in the amount of gold represented by each of them. "A rise in prices," wrote K. Marx, "would only be a response of the circulation process which is forced to equate the notes of value to that amount of gold which they replace in circulation."<sup>25</sup> In this instance, K. Marx concludes, "A note of value, regardless of the gold denomination with which it entered into circulation, in the sphere of the latter is compressed into a bill or note for that amount of gold which could circulate instead of it."<sup>26</sup> It is important to draw attention to the fact that in this process K. Marx saw the development of the contradiction between the function of the measure of value and the price scale. This leads to a bifurcation of the price scale into an official one and a market one operating spontaneously and actually negating the official one, for in actual reality the values of goods are expressed by the amount of it [the price scale].<sup>27</sup> The deepening of this contradiction under the conditions of modern capitalism has created the objective prerequisites for a complete legal abolishment of an official price scale at the beginning of the 1970's as this had actually lost its economic sense since the circulating of unchangeable paper bills and their inflationary support. However, this in no way means the degeneration of the measure of value into a price scale and the spontaneous elimination of the function of the measure of value on this basis. This also does not mean that within the system of monetary relations there has been the final formulation of the price scale into an independent function of money. It is merely a question of a violating of the old form of the relationship between the measure of value and the price scale and the formation of a new one, for their functional role in the price formation system is realized on various planes and because of these in principle they are interchangeable.

The abolishing of an official state price scale which since the circulating of unchangeable paper money and the development of inflationary processes has actually been turned into a fiction in economic terms means the eliminating of the artificial boundaries which prevent the spontaneous fulfillment by gold, as the universal materialization of abstract labor, of its function as a measure of value on an international scale. The specific realization of this function is that the masses of commodity gain a value expression not in the value of the monetary commodity directly but rather through intermediate elements considering the relative value of the paper money. As a result, gold, as a world money, in its function as an international measure of value is correlated not directly to the mass of commodities but rather operates in the system of monetary relations as a unique measure of the "values" of national paper monies. "...Convertability into gold and silver in practice," emphasized K. Marx. in taking up the specific features of the functioning of unchangeable national paper money, "is a measure of value of any paper money which has gained its denomination by gold or silver, regardless of whether the paper money is convertible by law or not."<sup>28</sup> This important methodological thesis of K. Marx has maintained its validity also under the conditions of international monetary relations. In this regard, the purpose of a function for an international measure of value is to ensure primarily the reciprocal convertability of national monetary

units. This effect is achieved on the basis of the international migration of precious metal and its market operations which in fact represent the convertability of national currencies into gold.

In establishing the intermediacy of the international migration of precious metals on the world market, their trade and use as world monies in volume III of "Capital," K. Marx wrote: "The trade in gold and silver as commodities... forms a naturally occurring basis for the trade in ingots... or trade which mediates the functions of money as world money."<sup>29</sup> The notion that the trading in gold as a raw material, that is, as a commodity generally, mediates its functioning as a world money is exceptionally important for understanding the essence of the problem being analyzed. It contains the fundamental methodological thesis on gold trade as an initial relationship characterizing the use of the precious metal as a world money, and also poses the problem of the economic function of the gold selling price through which "the money of one nation is expressed in the money of another and thus everything is reduced to the gold and silver content in it, as the latter, as two commodities circulating as world monies, are reduced to the reciprocal, constantly changing ratio of their values."<sup>30</sup>

As a result, under the conditions of the internationalizing of monetary relations, there is a change in the nature of the relationship between function of the measure of value and the price scale. As the latter, the intrinsic weight units of the monetary commodity are employed but these, however, are not officially fixed,<sup>31</sup> as occurred under the conditions of the functioning of a state-established price scale, but rather on the basis of a market mechanism these change corresponding to changes in the relative value of the national currencies and are expressed by the market price for the sale of gold. This means that under the new conditions a separate economic function is formed for the price of selling a monetary commodity. Being international in its nature, the average market gold price purged of market and speculative factors operates as a unique spontaneous (market) paper money form for the scale of relative value for national currencies and through this the international measure of the value of a monetary commodity is realized.

Thus, under present-day conditions the function of the measure of value is realized through the actual price scale which develops spontaneously on the basis of the market paper-money gold price, the dynamics of which, expressed in the corresponding national monetary units, reflects real changes in the relative value of capitalist currencies. This characterizes the relationship of the national production sphere and the international circulation of a monetary commodity, the internal and external spheres of monetary circulation, world currencies and the national notes of value. At the same time, in including the possibility of deviating from its value base under the effect of market factors, the market price of gold possesses a certain independence and this, in turn, necessitates the considering of additional factors which determine the specific features of its functioning. This reflects the actually existing contradictions in correlating the component elements of the present-day monetary mechanism in the system of which the value of a monetary commodity maintains the importance of the basis proceeding from which the structural integrity of the international system of monetary relations is formed.

#### FOOTNOTES

- <sup>1</sup> K. Marx and F. Engels, "Soch." [Works], Vol 23, pp 107-108.
- <sup>2</sup> Ibid., Vol 13, p 49.
- <sup>3</sup> In drawing attention to this thesis, F. Engels in the "Outline of Volume 1 of 'Capital'" wrote: "A change in values by monies...presupposes...an ideal setting of prices, an actual setting of prices" (K. Marx and F. Engels, "Soch.," Vol 16, p 255).
- <sup>4</sup> K. Marx and F. Engels, "Soch.," Vol 23, p 118.
- <sup>5</sup> "...A commodity," wrote K. Marx, "initially should be exchanged for...a universal commodity, for a symbolic universal product of working time or for its symbolic universal materialization in order then, as an exchange value, to possess the capacity to be exchanged indifferently for any of all other commodities, and to be turned into them" (K. Marx and F. Engels, "Soch.," Vol 46, Part I, p 112).
- <sup>6</sup> K. Marx and F. Engels, "Soch.," Vol 23, p 105.
- <sup>7</sup> Ibid., Vol 26, Part III, pp 164-165.
- <sup>8</sup> In the work "Wages, Prices and Profit," in speaking about the mechanism for realizing the measure of value and the price scale, K. Marx delimited the concepts of a "natural price" and a "market price" corresponding to the designated categories (see: K. Marx and F. Engels, "Soch.," Vol 16, p 129).
- <sup>9</sup> K. Marx and F. Engels, "Soch.," Vol 46, Part I, p 135.
- <sup>10</sup> In describing the multiple stages of the price formation process, K. Marx wrote that initially "in a commodity the exchange value operates as an ideal definition, as an ideal equating to money (in its function as a measure of value.--A. G.); then it gains in money, as coinage (through the price scale.-- A. G.) an abstract, one-sided but transient existence as just value; then value is extinguished in the consumer value of the purchased commodity" (K. Marx and F. Engels, "Soch.," Vol 46, Part II, pp 465-466).
- <sup>11</sup> K. Marx and F. Engels, "Soch.," Vol 13, p 56; see Ibid.: Vol 26, Part III, p 164.
- <sup>12</sup> See Ibid., Vol 46, Part I, p 112.
- <sup>13</sup> Ibid., Vol 23, p 111.
- <sup>14</sup> Ibid., p 113.
- <sup>15</sup> Ibid., Vol 16, pp 254-255.
- <sup>16</sup> Ibid., Vol 13, pp 64-65.
- <sup>17</sup> Ibid., Vol 46, Part I, p 181.

<sup>18</sup> Ibid., Vol 46, Part I, p 181.

<sup>19</sup> Ibid., p 149.

<sup>20</sup> Ibid., Vol 23, p 98.

<sup>21</sup> Ibid., Vol 46, Part II, pp 307, 308.

<sup>22</sup> For this see: A. S. Gal'chinskiy, "The Mechanism for Realizing the Function of the Measure of Value," MIROVAYA EKONOMIKA I MEZHDUNARNODNYYE OTNOSHENIYA, No 7, 1980, pp 119-128.

<sup>23</sup> K. Marx and F. Engels, "Soch.," Vol 23, p 135.

<sup>24</sup> Ibid., Vol 13, p 103.

<sup>25</sup> Ibid., p 103.

<sup>26</sup> Ibid., p 104.

<sup>27</sup> In taking up this question G. A. Kozlov has written: "Monopolistic prices, in developing under the influence of objective and subjective factors, lead to a change in the price scale as an immediate objective result of altered economic conditions. Consequently, the values of commodities under these conditions in fact are measured not by the price scale officially set by the state but by a spontaneously developing other price scale. It is not officially proclaimed by anyone, but nevertheless it actually exists as a spontaneously arising unit for the correlating of prices" (G. A. Kozlov, "Deystviye zakona stoimosti v usloviyakh sovremennogo kapitalizma" [The Action of the Law of Value Under the Conditions of Present-Day Capitalism], Moscow, 1964, p 310).

<sup>28</sup> K. Marx and F. Engels, "Soch.," Vol 46, Part I, p 72.

<sup>29</sup> Ibid., Vol 25, Part I, p 349.

<sup>30</sup> Ibid., p 350

<sup>31</sup> "...On the world market, where state frontiers disappear, these national natures of monetary measures (having in mind the national price scales.--A. G.) also disappear and give way to the general measures of the weight of metals" (K. Marx and F. Engels, "Soch.," Vol 13, pp 57-58).

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## INVESTMENT, PRICES, BUDGET AND FINANCE

### ROLE OF MARGINAL EXPENDITURES, PRICES IN MINERAL VALUATIONS VIEWED

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[Article by A. S. Astakhov: "Marginal Expenditures and Prices: Their Role in the Theory and Practice of an Economic Assessment of Mineral Reserves"]

[Text] The questions are examined of employing the indicators of price and marginal expenditures in an economic assessment of mineral reserves. The theoretical and practical considerations are advanced in favor of using primarily marginal expenditures for these purposes and not prices.

Mineral reserves comprise a portion of the national resources. In a certain sense this is the portion requiring the most careful attention, for in contrast to a majority of the other resources they cannot be replenished. At the same time, the amount and national economic significance of the given type of resources up to the present have been judged predominantly only in physical indicators and only in special calculations in a monetary form. A uniform, strict and regular evaluation of the economic importance of mineral reserves in our nation as yet has not been made. This situation does not contribute to the efficient use of the existing reserves.

The uniform Standard Provisional Procedures [1] first approved in 1979 regulates the basic initial principles for an economic assessment of mineral reserves and creates the necessary basis for carrying out practical work in this area. At the same time, for a number of important provisions, in the course of the preceding debates a unity of opinions and a sufficient degree of elaborating the problem were not achieved. One such problem of particular significance is the use of the instrumentarium of wholesale prices for an economic evaluation of mineral reserves. The procedures allows a certain dualism in the recommendations on the given question. Sharp debates in this area arose at the Conference for Assessing Mineral Resources held in 1980 in Lkhushalu.

Until recently, Soviet economic science, in relying in evaluating mineral raw materials exclusively on the theory of value (in our view, it has too simple an interpretation), totally denied the possibility of a monetary evaluation of mineral reserves. It was assumed that these reserves acquire this only as labor is invested in their industrial development. It was felt that the value of an unexplored deposit



equalled zero, an explored one was determined by the actual expenditures on its exploration, while a developed one was determined by expenditures on its exploration, construction and so forth.

Theoretically such a concept did not fully conform even to the theory of value, since value is formed, as is known, by the expenditures of not concrete but socially necessary labor. For this reason the actual labor expenditures in a deposit to be assessed in no way characterize the amount of the formed value. Discrepancies were also noticed in a number of other regards. The assessments did not respond to the quality of the mineral. Reserves lying in the least favorable conditions should be assessed higher. The assessment of the deposits was in no way linked with the current or even the long-range needs for raw materials while the slogan of the need for such correlation was left suspended. In assessing the reserves, no consideration was given to the expenditures on compensating for them from other sources, particularly if these would arise in the future. This was a major drawback of the method as the possibilities of compensation for individual types of minerals are extremely different while their presence and the level of expenditures on compensation have a serious impact on the question of the acceptability of losses. From the viewpoint of economic theory, the designated concept of assessing the reserves was based on local methods for evaluating the effect and did not consider a number of the important national economic relationships.

The practical consequence of a system of "gratis" mineral wealth are clear from the following example, although one taken to the absurd: from its position it would have been possible to have the loss of the unique reserves of the KMA [Kursk Magnetic Anomaly] in that not distant past when the basin had not been explored and the presence of the ores was shown only by the deflection of a magnetic arrow. The actual losses in accord with the given concept, if they could be calculated in retrospect, would amaze the imagination no less than the given fantastic example.

More constructive would be an approach to an economic evaluation of minerals based upon the concept of the effect brought by them as interpreted as the exceeding of the achieved result over the expenditures made. A resorting to the established wholesale prices would be a natural and, in any event, traditional approach to calculating the "result" (or, in other words, the maximum acceptable expenditures on the mineral raw materials). In this instance, an economic evaluation of a ton of reserves would simply be reflected by the difference of  $P-C$ , where  $P$ --the wholesale price of the given natural resource and  $C$ --the cost (or "calculated expenditures") of obtaining ("mining") it. The given difference of  $P-C$  in this instance would be the ordinary profit and all questions would be reduced to whether or not one should calculate this per ton or per total bulk of the reserves to be assessed, whether to discount or not and so forth. Precisely these are the proposals of a number of authors and they coincide with the established canons which have proven themselves in related areas and derive from the general methodology for evaluating production efficiency, fixed capital, and capital investments.

However, the problem is that such a traditional approach does not reflect those profound specific features which are inherent to the given object of evaluation, the mineral resources. Of all the other objects of economic evaluation (products, fixed capital and so forth), the given resources differ fundamentally in their initial

"uncreatability" and unreproduceability. It is clear a priori that the presence of such profound differences in the nature of the given objects should be reflected in the methodology of evaluating them; even for this reason the traditional approach which has proven itself in other areas is not fully applicable here. More specifically, here the issue can and should be about the following theoretical arguments.

1. The price and the profit derived from it are very approximate, purely cost accounting descriptions of production efficiency. They merely substitute for the true national economic efficiency criterion expressed by the amount of created net income. In truth, the differences between the amounts of profit and the created net income in many sectors are slight. But the gap between them is enormous precisely in the mining sectors. According to the estimates of M. P. Pavlov, the total net income created in the Soviet coal industry in the 1970's exceeded the profit at the established prices by 2.5-fold. The sharp, stable over the decades and obviously difficult to surmount understating of prices for mineral (and particularly fuel) resources is a fact that has become socially recognized only very recently.

2. The mineral reserves are one of the types of natural resources and for this reason the evaluation methodology should in principle be uniform for all of them. But if we proceed from the fact that the price is the value of a commodity expressed in money, then the prices for mineral resources generally cannot be established, since, in not being the result of human labor, these resources do not yet possess an exchange value. In any event, such natural resources as air and land, under the conditions of a socialist society, virtually do not enter into the sphere of commodity-monetary relations and the indicator of their price is virtually absent because of a lack of need. It would also be difficult to imagine the methods for calculating this price based upon the existing general principles of planned price formation. Certainly the price for mass goods is determined proceeding from the expenditure level for their production while natural resources are not produced by anyone. With all the need for a monetary expression of the "value" of natural resources, obviously price should not be the means of expression but rather some other distinct economic concept.

3. Even when prices are set for those types of natural resources which are then an object of the subsequent application of human labor (mineral resources would be among these) the prices far from always accurately reflect the national economic value of the given resources. With the presently adopted price formation methodology, these prices are ordinarily set proceeding from the average sectorial expenditure level for mining the mineral raw materials. But expenditures are greatly differentiated in terms of the mining and geological factors and the natural quality of the mineral. Under these conditions the setting of prices proceeding from the average sectorial expenditure level on mining inevitably leads to the appearance of an artificial large group of apparently inefficient or "planned loss" enterprises. In the coal industry, even in years when the sector as a whole was profitable, the number of these enterprises reached up to one half the total number of mines. Such a practice possibly does have definite justifications but undoubtedly the price here ceases to be an accurate instrument for assessing the national economic effectiveness of mineral raw material reserves. Over time the situation will be further aggravated by the extremely rare price revisions under the conditions of a constant rise in expenditures on mining due to the ever deteriorating mining and geological conditions. But even at the moments of increasing prices occurring every 10-15 years, the maintaining

of the price formation principle (proceeding from the sectorial average expenditure level) merely reduces the share of "planned loss" enterprises but cannot fully eliminate them.

In entrusting to prices the function of redistributing between the sectors the income created within them, we thereby make the price a less accurate measure of the actual production efficiency of a given product. This particular feature cannot be considered a drawback of one or another price list. It is inevitably linked to a multiplicity of functions imposed on prices as an economic category. In carrying out a multiplicity of functions which do not coincide with one another, prices involuntarily compare with each of them individually somewhat worse than could be the case of their "single purpose" setting.

4. Prices regulate existing and not future production conditions (otherwise they would not perform the role of the regulator of current cost accounting relationships). As for the indicators of an economic evaluation, their role is broader and they should provide a managing of these resources based on positions of not just today but also a rather distant future.

5. The degree of the specific limitation of one or another type of mineral resource is reflected by prices very incompletely and not always. If this is reflected, then again it is only to the degree that the resource is scarce now and not to the one to which it will become scarce sometime later, with its near depletion.

6. The price for mineral resources (for example, coal) does not consider the socially necessary expenditures in the "related" types of production which substantially influence the economics of using the reserves of one or another specific deposit as well as the expenditures on creating a regional infrastructure, although for the new deposits of Siberia and the North precisely these determine the end results of their development. The same applies to the expenditures on transporting the mined mineral to the consumer, the distances to which vary from several score to thousands of kilometers so that even the average expenditures on transporting many types of bulk mineral raw materials exceed the expenditures on their mining. As a whole it can be stated that the price does not establish the consumer's total socially necessary expenditures related to the use of mineral raw materials, in restricting the list of these expenditures to just individual links in a single chain of processes involved in the exploration, mining, processing, transporting and consuming of mineral resources.

7. Due to many factors, the current mechanism of planned price formation is inflexible. For example, the price for coal has remained unchanged for 13 years, while the capital intensiveness of underground coal mining has doubled while world prices for fuel have increased by several fold with the importance of coal in the fuel and energy balance of the USSR and world being fundamentally revised. There is no need to say that the coordinating of domestic wholesale prices for mineral raw materials with the national economic demand for them and with world prices under these conditions has been very insufficient.

Because of the designated circumstances, our thesis is as follows: the prices for a mineral resource and the profit derived from it theoretically cannot become a



priority instrument for the economic evaluation of these resources, at least with the existing price formation methods. Here we need a special instrument which more accurately reflects the very essence of the effect received from the use of the natural resources.

Let us pose a question: what is the essence of the national economic effect from the use of a specific deposit? For an answer it is best to examine what would happen in the national economy if it was deprived of a given (let us assume, exploited) deposit. If the given type of raw material is essential for the national economy, its shortage would be made up by an analogous (or substituting) raw material from another deposit.<sup>1</sup> In reasoning logically, the compensating expenditures should be higher than at the deposit being assessed, since otherwise the compensating deposit should have been put into operation first, earlier. In actuality it can be considered that these are deposits whose turn has not yet arrived for effective development. In literature an apt but not very precise name of marginal has been established for them.

Marginal expenditures for a certain type of raw material (or any other natural resource) characterize the maximally acceptable expenditure level for a national economy related to putting the given type of raw material into use with the given market conditions.

The exploitation of any deposit to be assessed frees the national economy from the need to involve (over the given period) the marginal deposits. The designated portion of raw materials here enters the national economy with certain individual expenditures  $I$  inherent to it. Otherwise from the marginal deposit the batch would be received with extremal (marginal) expenditures  $M$ . The difference of these expenditures  $E = M - I$  characterizes that net effect which the deposit being estimated would bring the national economy. The amount of this effect can also be adopted as its economic evaluation. It is not hard to see that the indicator  $E = M - I$  is nothing more than the potential differential unearned income created at the deposit being valued by the better mining and geological conditions. For this reason it can be felt that the concept of differential unearned income should lie at the basis of the proposed methodology. However, more constructive for subsequent methodological studies would be an interpretation of the  $E$  index proceeding from the method of obtaining it, that is, in the form of the really created effect of substitution. Obviously  $E$  simultaneously characterizes both the national economic harm in the event of a possible loss (or from the refusal to employ) the designated portion of the mineral resource.

In essence, an assessment of reserves on a price basis is oriented to considering the labor previously invested in them while an assessment using marginal expenditures focuses on the conditional expenditures for reproducing analogous supplies at the moment of the demand actually arising for them. Both these evaluation concepts make economic sense, however, the second one is richer. Thus, in the instance when reproduction conditions change over time, the rent concept considers the presence of these changes while a value one overlooks them. Such changes in the reproduction

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<sup>1</sup> An instance when it is completely impossible to compensate for the loss of a deposit is not examined; it is a more complicated task to assess its economic consequences.

conditions and growth of expenditures for this are typical for the ore-mining sectors while a concrete reflection of these trends makes the assessment more realistic.

Let us point out a number of other important particular features and merits in valuing mineral raw material resources using marginal expenditures and not prices.

- a. The expenditures I and M are accounted for along the entire chain of technological processes involved in putting the designated raw material into national economic use (exploration, the construction of mining enterprises, mining, dressing, transporting to the point of consumption, and expenditures which are dependent upon the consumer). Naturally the evaluation is given calculated in terms of the end product obtained from the given mineral resource.
- b. The expenditures are viewed over a protracted and forecasted period of time considering all the anticipated changes in the expenditures levels, the value conditions, the amount of demand for the given raw material, equipment and so forth. When needed these calculations can also take into account such a traditional aspect of the "time factor" problem as the economic imbalance of expenditures made at different times. Thus, the dynamic aspects (which are so acutely inherent to the problem of resource utilization) are adequately reflected with the given methods.
- c. Such general future conditions as the increased demand for the mineral raw material, the diminishing of availability of its unreproduceable reserves, the discovery of new deposits, technical progress and the development of substitutes are directly reflected in the level and dynamics of the marginal expenditures M and are thereby directly considered in the obtained estimates.
- d. The expenditures I and M are determined by calculation and are oriented at the same, normative level in the organization of production as well as the same technological and value standards. This is particularly important in the ore mining sectors with their high expenditures of manual labor under variable mining and geological conditions. As a whole this gives rise to a low organization of production which varies at the different enterprises. The organizational differences (ordinarily not eliminable even in the plans) have no bearing on the evaluation of the objective geological base and their elimination is fundamentally important in the calculations.
- e. Analogously to what has been said, the calculation of all the expenditures is based on not the actually employed but rather the optimum technical means and decisions for each mining and geological conditions.
- f. In calculating marginal expenditures M, involved are not only all the possible suppliers of the mineral raw material which is being directly estimated but also the variations for creating its effective substitutes.
- g. The volumes of the foreign trade deliveries of the raw material being estimated are also involved in this calculation. In determining the demand for the given raw material export requirements are taken into account; in establishing the sources for covering this need, in the event of necessity, it is possible to take into account imports considering the forecasted world prices. In calculating such foreign trade

coverages it is also possible to include a broader assortment of commodities from other sectors which serve as articles in clearing reciprocal coverages.

The designated particular features convincingly, in our view, show the major methodological advantages of the rent (based on marginal expenditures) concept of resource evaluation in comparison with a price one since it is a question of an unconditionally broader national economic approach.

Finally, let us examine the same question from a purely practical viewpoint.

The basic arguments for the supporters of prices against the criterion of marginal expenditures often come down to the fact that its use leads to the shifting of a significant portion of inefficient (unprofitable) reserves to balance ones. Let us begin by saying that such an argument is essentially invalid. The fact that the new methodology provides different results than the old one goes without saying. If there was a satisfaction with the results of the old methodology, there would be no need to search for a new one. For this reason the currently existing notions about the amount of reserves of certifiable condition cannot serve as a standard of accuracy; on the contrary, precisely these are an object of further exploration and adjustment. To judge what assessments are more accurate it is essential to base oneself upon a critical examination of the soundness of the very procedural provisions. Those estimates are sounder when the methodology for obtaining them is more advanced.

However, using a simple example let us examine the practical differences obtained in evaluating reserves using listed prices and the extremal (marginal) expenditures.

Let us examine a monoprodukt sector of the ore mining industry. Twenty mineral deposits (sections) are known, a portion of which is already presently exploited while the other is possible for exploitation in a future period. Indicators for enterprise capacity and expenditures have been calculated for the operating and free sections (see the table).

The table gives the indicators which form an evaluation of the reserves for the designated areas according to the price and rent concepts. The price  $P$  is constructed by multiplying the average sectorial cost  $C$  of the sections being worked by the fund-forming normed coefficient  $k_f$  which we accept as equal to 1.12. A further evaluation of the deposits  $E_e$  in this instance is calculated in the form  $E_e = P - C$  rubles per ton. The rent evaluation  $E_r$  is determined proceeding from the proportional amount of the forthcoming expenditures  $I$  calculated as the total forthcoming adjusted capital investments  $K_{pr}$  and the current outlays (without amortization deductions for renovations)  $C_o$ . These forthcoming expenditures for the sector as a whole serve as the basis for calculating the amount of the marginal (extremal) expenditures  $M$ . For finding the marginal expenditures, the deposits are ranked in the table according to the amount of expenditures  $I$ . Having assumed in our example that the national economic demand for the given mineral is 24 million tons per year, from the table we can determine the amount of the marginal expenditures equal to 14.3 rubles per ton.

According to the rent methodology of evaluation, the first 15 deposits are effective (with expenditures  $I$  less than the marginal). Let us examine what the result would

№ участка 1)	2) Себестоимость 1 т. руб. (C)	3) В том числе		Приведенные предстоящие капитальные затраты, руб/т 6) (K <sub>уд</sub> )	Предстоя- щие пол- ные удель- ные затра- ты, руб/т (I = C <sub>э</sub> + K <sub>уд</sub> ) 7)	8) Годовая мощ- ность пред- приятия, млн. т (M <sub>г</sub> )
		4) амортизация на ренова- цию (A)	5) текущие издержки (C <sub>э</sub> )			
1	9,5	1,0	8,5	—	8,5	2,5
2	9,7	1,0	8,7	—	8,7	2,5
3	8,8	0,8	8,0	1,0	9,0	2,0
4	8,7	0,6	8,1	0,9	9,0	2,2
5	10,1	1,0	9,1	—	9,1	1,7
6	9,0	1,0	8,0	1,5	9,5	1,9
7	9,4	1,3	8,1	1,7	9,8	1,5
8	9,6	1,0	8,6	1,5	10,1	1,2
9	10,2	1,2	9,0	1,5	10,5	1,2
10	10,5	1,5	9,0	2,0	11,0	1,5
11	12,6	1,3	11,3	—	11,3	1,2
12	11,5	1,9	9,6	2,3	11,9	1,0
13	11,8	2,0	9,8	2,7	12,5	1,0
14	13,3	1,0	12,3	1,2	13,5	1,5
15	12,5	2,5	10,0	3,8	13,8	1,1
16	13,2	2,0	11,2	3,1	14,3	0,9
17	13,0	2,0	11,0	3,5	14,5	1,2
18	13,9	1,5	12,4	2,8	15,2	1,5
19	17,7	1,8	15,9	—	15,9	0,9
20	16,4	2,1	14,2	2,7	17,0	0,9

24,0

- Key: 1--Section No;  
 2--Cost of one ton, rubles (C);  
 3--Including:  
 4--Amortization for renovation (A);  
 5--Current expenditures (C<sub>э</sub>);  
 6--Reduced forthcoming capital expenditures, rubles per ton (K<sub>pr</sub>);  
 7--Forthcoming complete proportional expenditures; rubles per ton (I = C<sub>э</sub> + K<sub>pr</sub>);  
 8--Annual enterprise capacity, million tons (M<sub>a</sub>).

be in using the price estimate. In covering a demand for 24 million tons of mineral, in this instance it would be advisable to exploit sections with the lowest cost. According to the table it is not hard to see that these would be sections No. 1-13, 15, 17 and (partially) section No. 16. The average weighted mineral mining cost C in this instance would be 10.8 rubles per ton, while the price would be  $1.12 \cdot 10.18 = 11.4$  rubles per ton. All these sections with a lower cost would receive a positive evaluation, while those with a greater one would be viewed negatively and seen as ineffective. Among the ineffective ones would be sections 11-13, 15-17, the first of which would be effective according to the rent evaluation.

In what manner is it possible to compensate the national economy for the loss of all these six sections which produce 5.6 million tons of minerals annually? Obviously, only by putting into operation other, remaining sections No. 18-20. But the costs at these sections are even higher than at the rejected ones and overall expenditures in terms of costs here would rise, as a simple calculation shows, by 0.24 rubles per ton. Moreover, there would simply not be enough remaining sections to cover a capacity of 5.8 million tons and the national economy's demand for the given raw material would not be satisfied.

The only realistic way out of the situation it created would be to include the unprofitable sections Nos 11-13, 15-17 in the operating ones, that is, to abandon a realistic utilization of the price concept for evaluating the sections. The procedure of real actions here would be virtually the same as in the rent evaluation, that is, the sections would be included in the effective ones not by the condition of positive profit but rather in terms of the condition of a nonexceeding of the maximal expenditure level for that poorer section which would still be essential for covering the national economic demand for the given mineral raw material. The entire difference with the rent concept in practice would nearly come down to the fact that the cost C of the poorer section would be accepted as the "limit" and not its "complete forthcoming expenditures."

It is easy to understand that this small difference is not favorable to the price concept. Certainly the indicator of full expenditures, as a criterion, is broader and more accurate than costs. Capital expenditures are reflected by it directly and considering the time factor (while costs reflect only these indirectly and statically through the amortization deductions representing them). In our example, the sole difference between the "actually corrected" quasiprice and rent estimates would occur for section No 14; according to the rent estimate it would be of exploitable condition (since the expenditures I for it are below the limit ones), but according to the "price" estimate it would be below condition (since the costs for it are higher than for sections No 17 and 16). It is easy to calculate that the substituting of section No 14 for section No 16 and 17 would lead to a loss of the actual national economic effect measured by the amount I by  $13.5 \cdot 1.5 - [14.5 \cdot 1.2 + 14.3(1.5 - 1.2)] = -1.44$  million rubles.

Thus, a concept of selecting reserves based upon the ex-factory prices calculated proceeding from average sectorial expenditures in actuality is virtually unrealizable. According to it each time reserves with an expenditure level above the average would be unacceptable. But certainly any average amount is figured from an aggregate which includes both the better and poorer exploited sections. In proclaiming the average as the acceptable limit, we thereby cut off a portion of the aggregate which has given rise to it and this portion becomes "unprofitable" and should be excluded according to the results of the estimate. Having excluded this poorer half, we again obtain an aggregate (although a smaller one) which will also have its own averages and its own poorer sections which now will also cease to fit within the new average amounts. Here the process of cutting off the poorer sections could be continued until only one enterprise (section) would be left if this were not prevented by the amount of national economic need which had to be satisfied. With a strict positing of the problem, this demand should be ensured in any case. The criticized price concept taken in its pure form in actuality does not make it possible to meet this demand and is simply practically unrealizable. Any attempts to improve it in essence would lead to a determining of the limit acceptable expenditures which become the actual regulators of decisions related to the use of reserves and at the same time the level of average sectorial expenditures.

The differences in the price levels and the limit expenditures for mineral raw materials, as a rule, are not so great as many imagine. Usually an attempt is made to depict things as follows: expenditures, for instance, at the poorer coal mines of Sakhalin are 30 fold higher than at the best open pits of the sector, and for this



reason the marginal expenditures will be, obviously, many-fold higher than the current average sectorial price.

However, in actuality here it is essential to bear in mind the circumstances operating in the reverse direction: a) the price exceeds the average sectorial expenditures by the amount of the fund-forming coefficient; b) the marginal expenditures are oriented not at the actual but rather the calculated (normative) enterprise outlays purged of the worsening factors of unsatisfactory organization, the shortage of technical resources, the lags in modernizing production and so forth; c) the marginal expenditures are taken not from the indicators of the poorer currently operating enterprises but rather from the limit indicators for the optimum long-range plan of the sector; the poorer, technically backward present enterprises do not fall into this optimum plan, they will be reconstructed, closed down or considered with a level of economic indicators purged of the factor of unsatisfactory production organization; d) the calculating of all (including marginal) expenditures is carried out from the total of processes involved in exploration, mining, transporting the raw material to the consumer and so forth; the proportional indicators for these total expenditures will differ for the individual projects of the sector's optimum plan much less than their individual components; e) the reserves of such rigidly localized regions as Sakhalin Island do not fall at all into the general Union calculations for marginal expenditures. As a whole, the amount of marginal expenditures is ordinarily not so intimidatingly high as it may seem although it is higher than a majority of the current wholesale prices.

Theoretically, the gap between the levels of the listed prices and the marginal expenditures for mineral raw materials depends largely upon the ratio of 2 coefficients:  $k_w$  and  $k_f$ . By the former we understand the variation coefficient for proportion expenditures for the sector's sections. The higher the  $k_w$  the more strongly the marginal expenditures exceed the "average sectorial" price. By  $k_f$  we understand the coefficient for the fund-forming components of normative profit. The higher this coefficient the greater the price exceeds the average sectorial cost and, consequently, the closer the marginal expenditures are to it.

Let us give certain conclusions. Does the primacy given by us to the marginal expenditures indicator over prices in the procedure of an economic evaluation of mineral raw materials mean any playing down of the general enormous role of prices in the system of managing mineral resources? In no way. In individual sectors of the system, various regulating indicators are employed and each of them has its established place in the overall hierarchy of management. The place of prices in this hierarchy is enormous and operates on many levels. Here it is merely a question that for the needs of evaluating the economic importance of natural mineral raw material resources, different indicator operates more precisely, and this is the marginal expenditures. Basically it is not advisable to impose this additional function, in addition to all the remaining ones, on the instrument of prices.

However valid the coexistence of the paired indicators of prices and marginal expenditures within the single economic mechanism, does not the incorporation of the marginal expenditures mean something unnatural? In our view the answer again is no. The indicators of wholesale price and the maximum acceptable (marginal) expenditures are in no way exclusive but, on the contrary, complement each other in an essential manner

Let us turn to dispassionate mathematics: a combining of the average and limit characteristics has long been considered a required procedure for describing any multicomponent objects. All probability theory is based on it. A rational combination of these two types of characteristics is not a novelty for economic practice either. Among the typical limit indicators are, for example, the limit prices for new equipment, many State Standards for product quality, the maximum acceptable concentrations of atmospheric and water pollutants (MAC) and others. In control theory for any processes (including economic ones), particular attention is always given to monitoring the performance of the limit increasable production volumes. For precisely they have the basic influence on the dynamics of the overall final (average) indicators. The monitoring of the limit expenditures on increasable volumes and an analysis of the influence had by them on the averaged final indicators for the mass of enterprises provide a rather diverse description of the object of control as a whole.

The reasonable regulating of the upper, maximally acceptable expenditures for a product has a beneficial influence on the average sectorial expenditure level. The limit expenditures are the expenditures of the optimum plan (by its very essence and definition), in being guided by which as the upper limit, we guarantee the obtaining of the least average expenditures related to the mining and utilization of the designated mineral raw material.

Let us point out the instances for which the maximum acceptable expenditures and prices coincide. In the first place, this is all types of products the individual batches of which differ little amongst themselves in terms of expenditure levels. Here the limit expenditures do not differ from the price. Secondly, this would include instances with self-contained local areas of mining and consumption, when the mineral mined in the area cannot be shipped beyond it nor is replaceable in the given region by other own or shipped-in ones.

Thus, we are in favor of a reasonable combination of the categories of marginal expenditures and price in an economic evaluation of mineral reserves, but with a clear distinction among our priorities. We are convinced that here the criterial role should be given to marginal expenditures.

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## INVESTMENT, PRICES, BUDGET AND FINANCE

### BOOKS ON PRICE FORMATION, COST ACCOUNTING REVIEWED

Moscow VESTNIK MOSKOVSKOGO UNIVERSITETA in Russian No 4, 1981 pp 87-90

[Review by V. V. Gerasimenko of the monographs "Obshchestvenno neobkhodimoye rabocheye vremya i problemy planovogo tsenoobrazovaniya v usloviyakh razvitogo sotsializma" (Socially Necessary Working Time and the Problems of Planned Price Formation Under the Conditions of Developed Socialism) by Ye. S. Gorodetskiy, Moscow, Vysshaya Shkola, 1979, 144 pp; and "Khozh'aystvennyy raschet v usloviyakh razvitogo sotsializma" (Cost Accounting Under the Conditions of Developed Socialism) by A. Z. Seleznev, Moscow, Izd-vo Mosk. Un-ta, 1979, 182 pp]

[Text] The reviewed monographs are devoted to problems the theoretical elaboration of which is an essential condition for resolving urgent practical tasks in improving the economic mechanism during the stage of developed socialism. The Decree of the CPSU Central Committee and USSR Council of Ministers of 12 July 1979 "On Improving Planning and Strengthening the Effect of the Economic Mechanism on Increasing Production Efficiency and Work Quality" elaborated the ways for a comprehensive improvement in the entire system of the economic mechanism. The solving of these problems requires, in turn, more profound and complete political and economic research on the economics of developed socialism.

One of the most important areas in the political and economic analysis is research on the problem of the socially necessary working time and the nature and particular features of forming the socially necessary labor expenditures (SNLE) under socialism. The subject of the monograph by Ye. S. Gorodetskiy is devoted to this.

The monograph opens with a description of socially necessary working time and the socially necessary labor expenditures as economic concepts. In justifying this posing of the question, the author writes: "The complexity of the problem involved in determining and correlating labor expenditures consists in the need to disclose the degree of their sociality, that is, to determine the development level of the social nature of labor, the strength and degree of the relationship as well as the intercausality between the various production elements" (p 6).

Objectively in any society a need arises for selecting a variation for the allocation and utilization of production resources which would create an opportunity to achieve a maximum effect. Each stage in the development of social production is characterized by a specific type of social form for the determination and correlation of labor expenditures. In this regard the monograph states that "the degree of the sociali-



zation of labor and production has a direct impact on the social form of correlating the expenditures of social labor" (p 8). Thus, in moving from the barter to the commodity form of economic life, a specific social form is developed for expressing and correlating the expenditures of social labor, that is, value.

The author links the appearance of the category of socially necessary working time with the rise of commodity production (p 11). Since with the breakdown of the barter form of economic life, individual labor ceases to be a direct form of social labor, the task arises of reducing the diverse forms of specific labor to simple human labor devoid of differences. In this regard the question arises of the socially necessary working time which would operate as a measure of the socially necessary labor expenditures.

In examining the formation of SNLE under socialism, the author, in our view, correctly argues against the opinion that mature communism would destroy the contradiction between the actual labor expenditures on production and the social norm which expresses the objective production level and the structure of social needs. "The SNLE, being engendered by the commodity form of economic life, in its content reflects the development process of the social division of labor..." (p 29). This statement seems contradictory. In actuality, why is the SNLE the offspring of the commodity form of production and not a consequence of the development of the social nature of production, regardless of its form? In our opinion, precisely specialization and the exchange of activities in the form of a labor product necessitate a social evaluation of labor expenditures. The appearance of the category of the SNLE historically coincided with the breakdown of the barter form of production and the rise of the commodity one but was not a consequence of this commodity form. On the contrary, both processes have a common factor in the development of the social nature of production. Value operates as a form of the SNLE and not their cause. Otherwise it would be logical to conclude that the SNLE caused by commodity production will historically disappear with it. The author not only does not reach such a conclusion but develops the contrary idea on the preservation and development of the category of SNLE in a communist formation. The monograph contains a thesis on the relationship of the SNLE and value: "This SNLE.--V.G.) is a unique measure of the socialization of labor expenditures the correlation of which due to certain historical conditions does not occur directly but roundabout through market relationships..." (p 30). Such an argument by the author against the identification of the SNLE with value at the same time puts in doubt the cause-and-effect dependents between the development of commodity production and the appearance of the category of the SNLE. In our opinion, under socialism there is a change in the form of the social evaluation of labor expenditures, that is, a planned norm replaces the commodity form. The reasons for the social evaluation of labor expenditures lie deeper than this form. This is the social division of labor which develops continuously along with the need for an exchange of the results of labor and in the course of development alters the form of expression.

The monograph states that in accord with the nature of socialism, the SNLE "operate not as a fixed amount but rather as a unique series in distributing the expenditures of social labor.... However, the series of distributions for the expenditures of social labor is not infinite. An upper limit is formed which is determined, in the first place, by the achieved level of labor productivity, by the degree of development in the productive forces, and, secondly, by the needs of society" (p 23).

At the same time, since commodity-monetary relations survive under socialism, to a certain degree there will also be the "process of the averaging of the expenditures of social labor, as if fixing them in a certain amount" (p 4).

Also of interest in the author's position on the modification of value. "Modified value, its nature, the character of its formation and functioning are organically linked with the problem of proportionality on the scale of all social production. It fixes the relationship not between the individual enterprise and the sector, but rather between the sector, as an element of the social division of labor, and the national economy as a whole" (p 64). The work gives a formalized definition of modified value through the national economic production outlays (p 62). Planned price formation, in the author's opinion, confirms the modification of value under socialism, since "the current model of a planned price must ensure within certain economically sound limits the process of the expanded reproduction of production, particularly fixed capital as well as an economic incentive for production and its increased efficiency" (p 72-73).

The particular features of the formation of the SNLE in the natural-intensive sectors comprise an important part of the monograph. The relationship and intercausality are emphasized in the system of relationships between the agricultural sectors. Under capitalism, the intersectorial relations within the system of social production are linked by the need to realize an equal profit for equal capital and equal rent per unit of land. Under socialism, the process of the formation of the SNLE is altered but here also an opportunity arises for producing different products on the same area. Such a "possibility is realized under the conditions of the action of relationships of a direct material interest of the worker in the results of his labor, under the conditions of the functioning of cost accounting relations, when the enterprises are economically interested in selling a certain portion and achieving a profit norm. These aspects also determine the specific features in the intrasectorial relations in agricultural production and cause a specific form of the modification of value under socialism" (p 84). The book gives a formula for the model of national economic production outlays for the nature-intensive sectors (pp 87-88).

Regardless of the profound economic changes, in the lower phase of communism, the economic separation of the self-financing enterprises is still not overcome and this is caused by certain specific features in the nature and level of the socialization of production. This is particularly characteristic for cooperative enterprises. In establishing the thesis on the relative economic separateness, the author writes: "And although land and its underground wealth are an object of national ownership they still operate as objects exploited by an individual self-financing enterprise. Such an economic situation objectively brings about the preservation not only in the cooperative but also in the state sector of the economy, within the nature-intensive sectors, of a certain monopoly of land and its underground wealth as an object of economic exploitation" (p 90). From this he concludes that the value of excess surplus product assumes the form of rent.

The monograph also takes up the need to encourage the rational use of natural resources and the environment. It is proposed that the system of rent payments be organically linked to an economic evaluation of natural resources (p 99).

In studying the category of the SNLE, it is essential to analyze their quantitative determination. In examining value as a social relationship, K. Marx in "Capital" gives not only a qualitative but also a quantitative description of this category. The reviewed work analyzes the problem of measuring the SNLE in terms of the real conditions of developed socialism. In this regard it is particularly important to establish that measure by which it is possible to solve the question of the quantitative definition of the SNLE under socialism. "As long as the reasons which cause the conversion of a product of labor into a commodity survive...society is unable to directly determine and correlate the expenditures of social labor in their natural measure, that is, working time" (p 103). The monograph positively views the opportunity of utilizing the intersectorial balance which makes it possible to disclose the so-called full labor expenditures. However, as the author rightly points out, the unsolved problem remains of "considering the socioeconomic heterogeneity of labor which cannot be disregarded. Precisely this situation prevents one from asserting that full labor expenditures are also the value of a product which, as is known, is created by abstract labor" (pp 112-113).

In the work an important place is given over to the question of the role of prices in the system of categories for the political economy of socialism. The author notes that the problem of a planned price on the political-economic level cannot be considered completely and thoroughly elucidated. In actuality, it becomes evermore urgent "to disclose the specific manifestation of the new social content which fills the commodity-monetary forms, to disclose the relationship between the new content and those traits and properties which are inherent to such a phenomenon as commodity production generally and which to a certain degree will still remain under socialism. If one has in mind such a category as prices, then it is a question of disclosing the so-called duality of the planned price..." (p 121).

In examining the content of a planned price, the author reaches, in our view, a valid conclusion. The characteristic feature and new content of a planned price under socialism consist in the fact that it "begins to operate as a planned form for the accounting of the directly socialized labor" (p 123).

Among the urgent problems of economic theory and practice is also the improving of cost accounting under the influence of the development of the socialization of production. This aspect of cost accounting relationships has been examined in the monograph by A. Z. Seleznev. In this work particular attention has been paid to the problems of the development of cost accounting as a system and to determining the conditions and areas for increasing the role of cost accounting in improving the use of intensive reproduction factors. The monograph describes the developmental history of the theory of cost accounting and the methodology of its examination in soviet economic science. The author concludes that even "in the 1920's and 1930's a completely definite view had developed on the causal nature, essence and functional role of cost accounting and on its certainty as an economic form related to the planned use of commodity and monetary forms..." (p 36).

The development of the post war economy has sharply confronted political economy with the task of studying the system of objective economic laws under socialism. The problem of cost accounting is linked to the role and content of commodity-monetary relations under socialism. Certain economists have defined cost accounting as a

transitional form, denying its relationship to the system of economic laws for socialism and viewing it merely as a form of utilizing the law of value. The elaboration of the question about a new content for commodity-monetary relations under socialism makes it possible correctly, in our view, to grasp the essence of cost accounting under socialism. We feel that the author has accurately determined the differences between commercial accounting under the conditions of a market economy and socialist cost accounting (pp 46-47). On the basis of this the author emphasizes that cost accounting thereby fundamentally differs from the commercial relations under capitalism and that it carries a planning principle along with a value one.

A significant portion of the reviewed monograph is devoted to cost accounting as a category of political economy under socialism. Here the necessity and forms of manifestation and use for cost accounting are examined.

First of all the necessity of cost accounting is linked to the nature of socialist socialization. "There are two aspects of socialization: socialization in the aspect of establishing social ownership of the means of production and the development of the socialization of the labor process" (pp 60-61). The second aspect is characterized by the varying degree of the socialization of the labor process at enterprises, by the varying degree of production concentration and by the varying degree of orientation to satisfying social needs. "Since under socialism there still are objective conditions under which the vestiges of the old division of labor and the essential social differences in the production conditions remain," characteristic of it is an incompleteness of the socialization of production and the creation of an "absolute unity of the economy" (p 61). In the author's opinion, this is manifested in the existence of two forms of ownership, in the forms of orienting the enterprises to satisfy social needs and in the varying degree of social recognition for products of labor and their conformity to social criteria. This is characteristic of socialist socialization from the viewpoint of relative immaturity. The designated facts are used by the author as justification for concluding that elements of real commodity production are present. Under the conditions of commodity production, there is a need to measure the differentiated results of collective labor by a social measure, that is, by a measure of value. In turn, "measuring the results of collective labor by a social measure means that the results of operations by the enterprises, on the scale of which labor is unified, are economically separate" (p 62). Here the author validly defends the approach related to the delimitation of production-technical and economic separateness.

Certain authors deny economic separation but urge the independence of socialist enterprises. In this regard the reviewed monograph makes, in our view, a true clarification: "Independence is a legal expression for the common traits of the enterprise's economic situation within which there are two aspects; production-technical separateness related to the existence of a social division of labor and as such permanent; the relative economic separateness related to the separation of the result of activity and gradually withering away with the overcoming of the essential social differences in labor" (p 66).

Proceeding from the relative economic separateness of the enterprises, the author defines cost accounting as a form of individual reproduction and realization of enterprise economic interests. However the problem of economic in involving the



essence of cost accounting, has remained uninvestigated. A mention of the existence of economic interests serves the author as a unique transition to value forms, as ensuring the unity of interests under the conditions of commodity-monetary relations can only be carried out through value forms. "For this reason cost accounting is possible only where," the author comments, "the result of activities is realized in a value form and the reproduction process occurs in the form of the circulation of funds" (p 76).

It is possible to concur with the idea that "cost accounting, in integrating in itself a number of categories related to the economic form of the reproduction process, cannot help but be an economic category" (p 82). In actuality, cost accounting can be represented as a particular relation of society with an economic element and characterizing the form of reproduction on the level of this element. To elevate cost accounting to the rank of a law, as the book's author endeavors to do, is wrong. There can be no question of a new law but rather the coordinating of the action of economic laws on the level of an individual production element.

In our view, the monograph is less successful in dealing with the question of the forms of cost accounting. Under the heading "Categories on the Enterprise Level" which the author also calls categories of cost accounting (p 88), the specific indicators for an enterprise's cost accounting activities are introduced. For expressing cost accounting relations, terms are employed which the author endeavors to distinguish, although not always successfully. These are both categories, indicators, forms of cost accounting, the forms of utilizing the tools of cost accounting as well as the elements and subsystems of cost accounting. Thus it is emphasized that "the cost accounting subsystems exist only in a unity, and outside of this unity as such they cannot be" (p 100). From the author's position, this is essential for isolating "the main link in the chain" which is, in his opinion, the "incentive subsystem." However, "cost accounting...performs primarily an incentive role" (p 100), and there is no need to break it down into subsystems. This stems from the place of cost accounting relations in the system of production relations for developed socialism. The unity and concrete interaction of the various elements of cost accounting relationships should become a matter of special investigation in this part of the work. The author has been unable to go beyond the limits of general ideas upon the reciprocal influence of cost accounting subsystems.

The last chapter of the monograph, in our view, appears more interesting than the above-mentioned arguments about the forms and subsystems of cost accounting. Here ideas are given on a systems approach to employing economic indicators. The author warns the reader against over estimating one or another indicator, against an excessive infatuation with value indicators and, on the contrary, against disregarding them. The question of improving cost accounting incentives for the sectorial scientific research institute's has been examined in detail (pp 155-161).

The book's conclusion raises a problem the answer to which remains to be given. This consists in the interaction of all the cost accounting elements. The same could be said about the interaction of cost accounting with the other economic levers and incentives. The designated questions, although being widely reflected in the monograph, cannot serve as a good theoretical introduction to this problem.

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## INDUSTRIAL DEVELOPMENT AND PERFORMANCE

### NATIONAL ECONOMIC RATIOS UNDER CONDITIONS OF INTENSIFYING SOCIAL PRODUCTION

Moscow PLANOVYE KHOZYAYSTVO in Russian No 7, Jul 82 pp 50-64

[Article by M. Eydel'man, director of the Scientific Research Institute of the USSR Central Statistical Administration, professor and doctor of economic sciences: "Proportions in the National Economy in the Context of Intensification of Social Production"]

[Text] Intensification of social production, which is most closely bound up with essential changes in the basic economic proportions and improvement of the structure of the economy, requires more optimal and economical utilization of the country's production potential.

The principal economic proportions which to a considerable degree determine the structure and dynamic pattern of social production include above all the proportion between the production of the means of production (Department I of social production) and production of consumer goods (Department II). Establishment of correct relationships between these two largest departments is one of the basic tasks of planned guidance of the economy.

At the same time establishment of this most important proportion in the national economy is still not sufficient for thorough and comprehensive analysis of the specific economic proportions and for determination of the character of expanded socialist reproduction. The reason for this is that division of the social product into production of means of production and production of consumer goods is based on the actual use of the product. For instance, electric power or fuel used at enterprises for production purposes are classified under means of production, but the consumption for residential lighting and heating is classified under consumer goods. Sugar or textiles purchased and consumed directly by the population go under consumer goods, but the sugar used in manufacturing confectionery articles or the textiles used at garment enterprises in making clothing are classified under means of production. The grain from which flour is made, just like the flour consumed at enterprises to bake bread and bread products are classified under means of production. Only the finished baked bread and other bread products figure as consumer goods. Thus one and the same product may be classified under the means of production or consumer goods depending on its actual use.

A more thorough study of economic proportions and of the process of expanded socialist reproduction requires a further division of the products of Department I into those used for production of means of production and those used for production of consumer goods (I for I and I for II). It is also very important to divide Department I into the instruments of labor (machines, equipment, etc.) and the subjects of labor (raw materials, supplies, etc.). The planning of these proportions has very great importance to drafting a scientifically sound and balanced plan for economic and social development and for performing the tasks of communist construction.

Let us examine through specific statistical data how the basic economic proportions were formed in the seventies, when the task was set of converting our economy to a predominantly intensive development strategy.

An analysis of the growth rates of Departments I and II of social production and of dynamic changes in their relationships, just like investigation of the dynamic behavior of other indicators characterizing the physical makeup of production, must be based on a computation of these indicators in comparable prices, which makes it possible to draw correct conclusions concerning the tendencies and patterns of development of expanded socialist reproduction. The most highly systematized statistical data on growth rates of production of means of production and of consumer goods are available for the output of industry.

Industry is the leading sector of the economy because the study of the tendencies and patterns of relationships in the production of industrial products has paramount importance to planning the basic economic proportions of socialist reproduction.

Figures are given in the table below on the growth rates of the total volume of industrial output, on the production of means of production (products in Group A) and on production of consumer goods (products in Group B) in the years of Soviet power (Table 1, in comparable prices).

Table 1

Indicator				In percentage
	Industrial Output, total	Breakdown		Factor by Which Growth Rates of Output of Group A Exceed Growth Rates of Group B
		Means of Production (Group A)	Consumer Goods (Group B)	
1	2	3	4	5
1928/1913	132	155	120	1.29
1st Five-Year Plan (4 years: 1932/1928)	202	273	156	1.75

Table 1 (continued)

1	2	3	4	5
2nd Five-Year Plan (1937/1932)	220	239	199	1.20
Three prewar years of 3rd Five-Year Plan (1940/1937)	145	153	133	1.15
4th Five-Year Plan (1950/1945)	189	183	207	0.88
Years of Great Fatherland War (1945/1940)	92	112	59	1.90
5th Five-Year Plan (1955/1950)	185	190	176	1.08
6th Five-Year Plan (1960/1955)	164	171	150	1.14
7th Five-Year Plan (1965/1960)	151	158	136	1.16
8th Five-Year Plan (1970/1965)	150	151	150	1.01
9th Five-Year Plan (1975/1970)	143	146	137	1.07
10th Five-Year Plan (1980/1975)	124	126	121	1.04

As shown by the figures in Table 1, over all the periods given (except the 4th Five-Year Plan, the one which came after the war) the growth of the production of means of production (products in Group A) has been faster, and their share has increased in the total volume of industrial output. Moreover, in the first stages of development of the Soviet economy, especially in the period of the country's industrialization and the building of the foundation for a socialist economy, the growth rates of production of means of production considerably surpass the growth rates of the production of consumer goods. For instance, in the years of the 1st Five-Year Plan (1929-1932) the growth rates of products in Group A exceeded the growth rates of products in Group B by more than 1.7-fold, and in the years of the 2nd Five-Year Plan and the first 3 years of the 3rd Five-Year Plan (1933-1940) by 1.4-fold. This was caused by the need to build heavy industry in a short period of time, to strengthen the country's defense, to turn it into a highly industrial country based on the large-scale machine industry. As the productive forces developed, as the economic potential grew and became stronger, and as the party line was conducted toward a steady rise in the standard of living of the Soviet people, the tendency for convergence of the growth rates of the production of means of production and the production of consumer goods has been manifested ever more strongly. This tendency has been especially intensified in the present stage of development of socialist society--in the stage of advanced socialism. An analysis of the statistical data shows that the most substantial convergence of the growth rates of the production of means of production and the production of consumer goods began in the late sixties and early seventies. Moreover, in certain years (1968-1971) the growth rates of products in Group B even somewhat exceeded the growth rates of products in Group A. The same tendency is envisaged by the plan for the 11th Five-Year Plan.\*

Figures characterizing changes in the structure of the production of means of production and also of relationships in growth rates of the production of products in Department I for production of means of production and for

\* There were also certain years even earlier--1925, 1937, 1945 and 1946--when the growth rates of products in Group B were higher.



production of consumer goods are of great interest to economic analysis and planning. These figures on the production of industrial products over the period from 1970 to 1980 are given in Table 2.

Table 2

Indicator	In Percentage of Total*						
	1970	1975	1976	1977	1978	1979	1980
Production of means of production (Group A)	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Instruments of labor	20.4	19.4	19.5	19.6	19.7	20.2	20.3
Subjects of labor	79.6	80.6	80.5	80.4	80.3	79.8	79.7
Distribution of the total volume of production of the means of production:							
For Department I of social production	71.8	71.3	71.5	71.6	71.6	71.7	71.9
For Department II of social production	28.2	28.7	28.5	28.4	28.4	28.3	28.1
Growth Rates**							
Production of means of production (Group A)	100	146	154	163	171	177	183
Instruments of labor	100	161	178	194	207	222	233
Subjects of labor	100	142	148	155	163	167	172
Distribution of the total volume of production of the means of production:							
For Department I of social production	100	146	155	164	173	179	186
For Department II of social production	100	144	150	158	165	170	175

\* According to data on the volume of industrial output in wholesale prices of enterprises in effect.

\*\* According to data on the volume of industrial output in comparable wholesale prices of enterprises.

As we see from Table 2, the tendency for the growth of production of instruments of labor to exceed the growth of subjects of labor continued in the seventies, as did the tendency for the production of products in Group A for Department I to increase faster than the production for Department II. At the same time, the statistical data over a lengthy period show a tendency toward convergence of the growth rates of production of products in Group A for Department I and the growth rates of their production for Department II.

The figures given above on the relative share of products in Group A and Group B in the total volume of industrial output and on the changing structure and growth rates of production of the means of production were computed on the

basis of the total volume of industrial output in wholesale prices of enterprises (not including the turnover tax). This makes it possible to discover the most important economic proportions in production of industrial products. But that kind of analysis falls far short of reflecting the structure of social reproduction of the entire economy. In order to obtain a comprehensive description of the process of reproduction of the social product and of relations between production of the means of production and production of consumer goods (between Departments I and II) for the entire national economy as a whole, in addition to the production of industrial products, we also need to take into account the output of agriculture, construction, transportation and other branches of physical production. In our view these calculations should be made in final sales prices, i.e., in prices which include the turnover tax.

A description of the proportions between the two departments of the gross social product (in 1972 comparable prices) created in all branches of physical production is given in Table 3 (the calculations were made on the basis of retrospective intersector balances in the final prices of consumption).

Table 3

<u>Indicator</u>	<u>In percentage</u>			
	<u>1959</u>	<u>1966</u>	<u>1972</u>	<u>1977</u>
Gross social product, total	100.0	100.0	100.0	100.0
Breakdown:				
Production of means of production (Department I)	60.3	63.2	63.4	64.4
Production of consumer goods (Department II)	39.7	36.8	36.6	35.6

In the period under review the relative share of means of production in the gross social product, as we see from Table 3, has been rising invariably. But at the same time, beginning in the latter half of the sixties a tendency emerged for a substantial closing the gap between the growth rates of the output of Departments I and II. For instance, whereas between 1959 and 1966 the relative share of the output of Department I in the gross social product rose 2.9 points, between 1966 and 1972 it rose 0.2, and from 1972 to 1977 1 percentage point. In recent years (since 1977) the tendency toward convergence of the growth rates of the output of the two departments has continued. According to approximate calculations, in 1980 the relative share of Department I in the gross social product (in 1972 comparable prices) was 63.5 percent, or 0.9 point less than in 1977 and only 0.1 point higher than in 1972.

Thus a substantial convergence of the growth rates of production of means of production and production of consumer goods is taking place. This is determined by the orientation of the CPSU's economic policy toward solving the problems involved in increasing the prosperity of the people. Convergence of the growth rates of Departments I and II in the context of the economy's conversion to an intensive development strategy is ensured by fuller and more optimal utilization of means of production, by introduction of economical means of production in all sectors of the economy, and by economical expenditure of physical, labor and financial resources.

In our economics literature there have been quite a few treatments and statements concerning the economic law of more rapid growth of means of production than the growth of consumer goods. Certain economists do not acknowledge the existence of such a law and believe that the process of reproduction can develop at differing relationships and growth rates of Departments I and II. Moreover, the point of view held by a certain portion of economists is based on the assumption that this law is specific to the capitalist economic system and loses its significance in the context of the socialist economy.

Meanwhile the history of economic development in the USSR and in the other socialist countries reveals that kind of pattern, which is manifested with particular intensity in periods of transition to the industrial type of development, acceleration of scientific-technical progress and creation of a mighty economic and scientific-technical potential.

In taking up the questions of expanded reproduction under the conditions of capitalism V. I. Lenin wrote that Department I "can and must develop faster than the second (which constitutes a limit on its 'independence'), but it is self-evident that in the final analysis productive consumption always remains linked to personal consumption."\* This principle also applies fully to a socialist society in which production is accomplished in order to increase the material prosperity and raise the cultural level of the Soviet people.

The building of a powerful production potential in the stage of mature socialism and adoption of the course of a determined transition to primarily intensive factors of production does not preclude operation of the law of the predominant growth of Department I. The latter provides the means of production for the step-by-step development of the economy and for a continuous rise in its technical level.

Intensification of social production makes it necessary to improve the sectoral pattern of production. Given constant stable development of all sectors of the economy, those sectors on which acceleration of scientific-technical progress depends grow at faster rates. The sectoral pattern of social production is more and more taking on the progressive type of industrial features.

Production of industrial products, above all the products of heavy industry, is growing at faster rates, and as a consequence its share in the gross social product and national income is increasing. While the overall volume of output of agriculture is increasing, its share is dropping. At the same time there is a growing portion of farm products which go on to industrial processing.

All these relationships and growth rates for the various sectors must, of course, be balanced with one another and determined by the specific conditions and tasks of economic and social development in every stage. Table 4 shows the structural pattern and growth rates of the gross social product for the principal branches of physical production over the 1965-1980 period.

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\* V. I. Lenin, "Polnoye sobraniye sochineniy" [Complete Works], Vol 3, p 42.

Table 4

<u>Sector</u>	Dynamic Behavior by Years					
	In Percentages of Total (in prices of respective years)				In Comparable 1973 Prices (in percentage)	
	<u>1965</u>	<u>1970</u>	<u>1975</u>	<u>1980</u>	<u>1980/1965</u>	<u>1980/1970</u>
Gross (total) social product	100.0	100.0	100.0	100.0	238	167
Distribution by sectors:						
Industry	63.3	63.5	64.7	63.6	263	178
Agriculture	16.9	16.1	14.2	14.1	138	113
Construction	9.6	10.6	10.6	9.6	218	153
Transportation (freight) and communications (that part servicing the production sphere)	4.4	4.0	4.3	4.4	255	183
Trade, procurements, material and technical supply, etc.	5.8	5.8	6.2	8.3	358	230

As is evident from the figures given, the production of industry and also of transportation and communications has been rising at a faster rate. The high growth rates for the output of trade, procurements, material and technical supply and other sectors were achieved because of the growing balance in foreign trade operations.

This has been reflected in a particular way in the sectoral pattern which has taken shape in recent years, especially in 1980, when the relative share of the industrial sector in the gross social product in current prices dropped somewhat relative to 1975.

The change of prices has had an important impact on the sectoral pattern. If we calculate the relative share of the branches of physical production in comparable prices (which, as indicated above, is more correct for describing the change of the sectoral pattern of the production of the social product), the change of the shares of the principal sectors in the gross social product will look different. Table 5 gives the figures on the share of the principal branches of physical production in the gross social product (in 1973 comparable prices).

Table 5

<u>Sector</u>	<u>1965</u>	<u>1970</u>	<u>1975</u>	<u>1980</u>
Gross (total) social product	100.0	100.0	100.0	100.0
Distribution by sectors:				
Industry	60.3	62.8	65.8	66.7
Agriculture	19.8	17.0	13.1	11.5
Construction	10.7	10.6	10.6	9.8
Other sectors of physical production	9.2	9.6	10.5	12.0

As we see from Table 5, the relative share of industry in the gross social product has been growing invariably. In order to obtain a more vivid conception of the change of the sectoral pattern of social production over the period under review, we will give figures on the change of the relative share in the gross product of those principal sectors of physical production (industry, agriculture, construction) in which the product is created in physical form (Table 6).

Table 6

<u>Sectors</u>	In percentage			
	<u>1965</u>	<u>1970</u>	<u>1975</u>	<u>1980</u>
Output for the sectors enumerated below, total	100.0	100.0	100.0	100.0
Breakdown:				
Industry				
In prices of the respective years	70.5	70.5	72.3	72.8
In comparable prices	66.2	69.4	73.5	75.8
Agriculture				
In prices of the respective years	18.8	17.9	15.8	16.1
In comparable prices	22.0	18.8	14.6	13.1
Construction				
In prices of the respective years	10.7	11.6	11.9	11.1
In comparable prices	11.8	11.8	11.9	11.1

Thus the growth of the production of industrial products that is faster than that of other sectors producing products in physical form expresses most strikingly the intensification of the industrial character of social production. At the same time, as we see from Table 6, over the last 15 years there has been an undeviating increase in the relative share of production of industrial products not only in comparable prices, but also in current prices.

Important structural shifts are taking place within the industrial sector. In the total volume of industrial production there is an increase in the share of the branches of the manufacturing industry and a corresponding decline of the share of the branches of the extractive industry. As in the past such very important branches of heavy industry as machinebuilding, the chemical industry, the petrochemical industry and the gas industry have been developing at higher rates. The electric power industry has been growing at a fast pace. Of the other branches of machinebuilding electronics, production of automation equipment and control systems, instrumentmaking, the automotive industry, the production of machine tools with numeric programmed control and many others have been developing with particular speed.

In the branches of light industry and the food industry the silk and knitwear industry, the production of sewn goods, the milling and hulling industry and mixed feed industry, etc., have been growing at higher rates. All of these shifts that have been taking place in the production of industrial products in the seventies can be seen in the figures below, which show the growth rates of the total volume of industrial output by branches over the 1970-1980 period (in percentage of 1970 = 100).



<u>Branch</u>	<u>1975</u>	<u>1980</u>
Industrial sector, total	143	178
Breakdown:		
Extractive	126	138
Manufacturing	145	182
Portion of total volume of industrial output attributed to following sectors:		
Electric power industry	141	180
Fuel industry	133	154
Gas production alone	146	220
Ferrous metallurgy	128	141
Chemical and petrochemical	165	218
Machinebuilding and metal manufacturing	173	256
Machinebuilding alone	177	268
Within machinebuilding:		
Instrumentmaking alone	234	450
Computer equipment alone	406	450
Automotive industry	184	267
Production of machine tools with numeric programmed control	349	558
Production of equipment for the pulp and paper industry	183	260

There has accordingly been a substantial change in the sectoral pattern of production within the industrial sector. For instance, when 1980 is compared to 1970, the increase in the share of machinebuilding and metal manufacturing in the total volume of industrial output rose from 19.7 to 28.7 percent and that of the chemical and petrochemical industry from 5.7 to 7.0 percent. At the same time the relative share of the fuel industry dropped from 6.4 to 5.6 percent, that of the timber and lumber, woodworking and pulp and paper industry from 5.1 to 4.1 percent, that of the building materials industry from 4.1 to 3.6 percent. The share of the output of the electric power industry remained at the 1970 level (3 percent). The relative share of light industry and the food industry dropped from 38.9 to 31.8 percent over that period.

There have been changes in the relationship between the extractive industry and manufacturing industry. The relative share of the output of the extractive industry in the total volume of industrial output dropped from 8.9 percent in 1970 to 7.3 percent in 1980, while that of the manufacturing industry increased correspondingly from 91.1 to 92.7 percent.

In the process of development of social production, as it has become more intensive and scientific-technical progress has speeded up, new branches and new types of production operation have emerged, new and increasingly progressive types of machines and equipment, and new types of materials.

In the report address at the 26th CPSU Congress L. I. Brezhnev, summing up the results of the economic development of the USSR in the seventies, said: "Such up-to-date branches as nuclear power machinebuilding, space technology, electronics and microelectronics, the microbiological industry, laser engineering, the production of man-made diamonds, and also the production of other new

synthetic materials have undergone further development or have been newly created on the basis of scientific advances."\*

The process of intensification of social production is characterized by a speeding up of scientific-technical progress, by a rise in the level of mechanization and automation of production, and by an increase of labor productivity and the efficiency of social production.

By the end of 1980 the industrial sector of the USSR had more than 170,000 mechanized flow lines and automatic production lines, about 70,000 pieces of equipment with programmed control and about 90,000 fully mechanized and automated sections, shops and production operations. At the present time about 60,000 mechanized flow lines and approximately 80,000 automatic production lines are at enterprises of the branches of heavy industry, a substantial portion of them in machinebuilding, and the rest at enterprises of the food industry and light industry. Over a 15-year period (1965-1979) the number of mechanized flow lines and automatic production lines at industrial enterprises more than tripled, and the number of fully mechanized and automated sections, shops and production operations increased 3.7-fold.

Powerful new equipment was introduced in the seventies in all sectors of the economy--at electric power stations, in underground coal mines, in ferrous and nonferrous metallurgy, in machinebuilding, in light industry and the food industry, and in other sectors of the economy. At a number of enterprises new and more progressive manufacturing processes and production methods were introduced, and time consuming operations were mechanized in a number of sectors of the economy.

At the same time many laborious operations in the economy have still not been sufficiently mechanized. The mechanization of subsidiary and auxiliary operations is especially scanty. At the present time almost one-third of the workers in the industrial sector are doing manual jobs without machines and mechanisms, and in certain sectors of the economy this figure is still higher. The Basic Directions for the Economic and Social Development of the USSR Over the Period of 1981-1985 and Up to the Year 1990 provide for a 15-20-percent reduction of the number of workers employed at manual jobs in various ministries and departments.

The rise of the mechanization and automation of production is one of the most important factors in the growth of labor productivity and the efficiency of social production. Over the period from 1971 to 1980 the productivity of social labor, computed as the ratio of the national income to the number of persons employed in the branches of physical production, rose 46 percent, and labor productivity in the principal sectors of the economy, calculated on the basis of gross output, rose as follows: 50 percent in industry, 23 percent in agriculture (socialized production), 43 percent in construction and 25 percent in rail transportation.

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\* "Materialy XXVI s"yezda KPSS" [Materials of the 26th CPSU Congress], Moscow, Politizdat, 1981, p 33.

Intensification of social production and rising efficiency depend in large part on reducing the materials intensiveness of the product. In this connection there is great interest in an analysis of the proportions in which the gross social product is distributed between the fund for reimbursement of the material costs of production and the newly created value. Other conditions being equal (assuming the same structural pattern, unchanged prices, and the same organizational structure of production, and so on), a change of these proportions characterizes economical utilization of physical resources. But in actual reality many factors are operative here and have a substantial impact on these proportions. The figures given below show how these relationships took shape in the 1970-1981 period (Table 7).

Table 7

Indicator	Dynamic Behavior by Years				
	Billions of Rubles in Prices of Respective Years			In Comparable 1973 Prices, Relative to 1980, %	
	1970	1975	1980	1970	1975
Gross social product	643.5	862.6	1,072.3	167	123
Material costs of production	353.6	499.3	613.8	170	123
National income	289.9	363.3	458.5	162	123
Relative share of the material costs of production in the gross social product (in actual prices)	54.9	57.9	57.2	--	--

Over the period from 1970 to 1980 the materials intensiveness of the gross social product increased in actual prices. In comparable prices materials intensiveness increased to a far smaller extent. For instance, the relative share of material costs in 1973 comparable prices averaged 56.1 percent in the years of the 8th Five-Year Plan, 56.7 percent in the 9th, and 56.9 percent in the 10th.

The rise in material intensiveness of the social product in the seventies occurred mainly because of agriculture, in which the relative share of material costs in the gross output of agriculture rose substantially. If we determine the material intensiveness of the output of all sectors of physical production without agriculture, the relative share of material costs in comparable 1973 prices was dropping steadily--from 62.1 percent in 1965 to 58 percent in 1970 and 56.6 percent in 1980.

The growth of depreciation is having an important impact toward a higher share of material costs in the gross social product. In 1980 the depreciation charged in the national economy was 2.5-fold higher than in 1970, while the gross social product had risen 1.7-fold.

If the materials intensiveness of the national economy is calculated without depreciation (which in our opinion describes material intensiveness more correctly), this indicator for the national economy as a whole was essentially stable in comparable prices in the years of the 8th and 9th Five-Year Plans

and amounted to about 51 percent (with small fluctuations from year to year), but in the 9th Five-Year Plan it even dropped somewhat. The figures on materials intensiveness in the industrial sector look different. An analysis of these figures over a lengthy period (1965-1980) shows a manifest tendency toward a drop of materials intensiveness (Table 8).

Table 8

In comparable prices, in percentage

<u>Indicator</u>	<u>Five-Year Plan</u>		
	<u>8th (average over 1966-1970 period)</u>	<u>9th (average over 1971-1975 period)</u>	<u>10th (average over 1976-1980 period)</u>
Share of material costs:			
In the gross social product:			
Including depreciation	56.1	56.7	56.9
Without depreciation	51.1	51.2	50.5
In industrial output:			
Including depreciation	66.3	64.8	63.7
Without depreciation	61.9	60.0	58.3

Many factors, often operating in different directions, have an influence on the change of the materials intensiveness of social production. Structural factors have no small importance in this regard. An increase in the share of materials-intensive sectors causes an increase in the relative share of material costs in the gross social product, and vice versa. For instance, if the growth rates of industrial output, whose material intensiveness is relatively higher on the average, are faster than those of other sectors, there will be an increase in the relative share of material costs in the gross social product.

Conservation of physical resources and a drop in specific rates of consumption of raw materials, supplies, fuel and electric power have great importance in reducing the materials intensiveness of social production. Considerable success in conservation of physical resources was achieved in the seventies in certain sectors of the economy. For instance, the specific consumption of standard fuel at generating plants of the electric power system dropped from 0.367 kg/kwh in 1970 to 0.328 kg in 1980, or 10.6 percent. There has been a drop in the specific rates of consumption per unit output of rolled products of ferrous metals, fuel, building materials, etc. The Basic Directions call for conservation of fuel and energy resources in the amount of 160-170 million tons of standard fuel in the 11th Five-Year Plan, including 70-80 million tons through reduction of rates of consumption. Plans call for reducing the specific rate of consumption of rolled products of ferrous metals at least 18-20 percent in machinebuilding and metal manufacturing over the 5-year period, 10-12 percent for steel pipe, 9-11 percent for rolled products of non-ferrous metals, and so on. Reduction of costs of manufacturing fabricated (konstruktsionnyye) materials, above all rolled products of ferrous and non-ferrous metals, has great importance to reducing the materials intensiveness

of production. To that end the Basic Directions ... calls for faster growth of the output of progressive fabricated materials such as progressive and economical types of metal products, synthetic resins and plastics, composition materials, glued wood fabrications, etc. Resource conservation is a line of development in the production and consumption of fabricated materials and other physical resources that is becoming an important factor in performing these assignments.

At the same time an analysis of retrospective data shows that for the economy as a whole and within sectors materials intensiveness of social production is high and a very large potential exists for reducing it. The metal intensiveness of certain types of our machines and equipment is still high, fabrics are too heavy, and physical resources are not being used efficiently at a number of enterprises. A thrifty and stewardly attitude toward the resources of society, efficient and economical use of raw materials, fuel and energy and other physical resources, and consistent enforcement of an economy regime are taking on very great national economic importance under present conditions. This is all the more indispensable because as the volume of consumption of raw materials and fuel and energy has increased, there has been a substantial increase in the costs incurred in their extraction, production and transport. The extraction and transport of a number of types of raw materials and fuel-and-energy resources (because the conditions of their extraction are becoming more complicated, because the hauling distance is increasing) are becoming more and more expensive. For instance, according to available data, during the last 5-year period the costs of extracting 1 ton of petroleum exceeded by more than twofold those costs in the early seventies, and in the current 5-year period they will increase still more.\*

Reduction of losses in industry, construction, transportation, agriculture and other sectors represents a very large potential in the area of more efficient use of the country's available production potential. The losses of a number of agricultural products are particularly large: grains, potatoes, vegetables and fruit during harvesting, storage and shipment from point of production to point of consumption. There are substantial losses in trade, in transportation, especially of perishable products. There are large losses in extraction of raw materials. As is well known, as much as 30-40 percent of the coal, up to 50 percent of the gas, more than 50 percent of petroleum and up to 20 percent of the iron ore remain in deposits. Many useful ingredients in the raw material extracted are not utilized. Tailings contain a large amount of very valuable types of raw materials (zinc, silver, and so on). Maximum extraction of minerals from the earth, and multipurpose and thorough processing of the raw materials--these are aspects of one of the most important directions of the effort toward economical and efficient utilization of physical resources.

In 1981 the CPSU Central Committee and USSR Council of Ministers adopted a decree entitled "On Stepping Up the Effort Toward Economy and Optimum Utilization of Raw Materials, Fuel and Energy and Other Physical Resources," which emphasizes that a most important task of economic policy in the present stage is to put internal potential at the service of society. The decree offers an

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\* VOPROSY EKONOMIKI, No 8, 1981, p 4.



elaborate program for the conduct of specific measures toward economy and optimum utilization of raw materials, fuel and energy and other physical resources aimed at an all-out rise of production efficiency and intensification of the economy.

Ensuring the preservation of all the products produced in the economy, reduction and elimination of losses in all stages of a product's movement--from the moment of production to the moment of consumption, and optimal and economical utilization of all resources--these represent one of the main factors and indicators of intensification of the economy and of its rising efficiency.

The relationship between the net income of enterprises in the production sphere (including the turnover tax) and the fund to remunerate the work of workers employed in that sphere, which characterizes the breakdown of primary distribution of the national income in value terms, is an important economic proportion. Table 9 presents figures characterizing the change of these relationships over the last 20 years computed from the data of retrospective intersector balances in the stage of primary distribution of the national income.

Table 9

<u>Indicator</u>	In actual prices in effect, relative to fund for remuneration of labor, %				
	<u>1959</u>	<u>1966</u>	<u>1972</u>	<u>1977</u>	<u>1980</u>
Branches of physical production, total	88	90	98	102	105
Separately for branches producing products of the following:					
Department I	62	71	82	82	--
Department II	139	125	127	137	--

The figures given in Table 9 on the ratio of the net income of enterprises in the production sphere to the fund for remuneration of labor of workers employed in that sphere (we will refer to them as the rate of net income) show a manifest tendency toward growth. Moreover, in sectors producing means of production, this ratio rose substantially between 1959 and 1972 and experienced practically no change, became stable between 1972 and 1977, while in sectors producing consumer goods there was a considerable drop in the period from 1959 to 1966 and then a rise, especially in the period from 1972 to 1977. The higher rate of net income in Department II is determined by the fact that the turnover tax was included in the net income of this department in accordance with the price system in effect. The rate of net income is relatively low in construction and agriculture. These rates have fluctuated greatly from branch to branch of industry, though as a result of a number of revisions which have been made in wholesale prices in the industrial sector and improvement of the system of price setting, they have converged considerably. The rate of net income as an average for all the branches of industry dropped somewhat in the period from 1959 to 1966, but from 1966 to 1972 and in subsequent years it rose substantially, mainly in connection with the introduction of new

wholesale prices of industrial products as of 1 July 1967 and a number of subsequent changes of wholesale prices. At the same time in the branches of heavy industry it increased over the entire period under review, and in the branches of light industry and the food industry it has dropped considerably. As a result the gap between the rates of net income in these branches decreased from 6.8-fold in 1959 to 3.8-fold in 1966, 2.8-fold in 1972 and 2.5-fold in 1977. The rate of net income in construction increased notably over the period under review, though even now it remains a fraction of what it is in industry.

The relationships between net income and the fund for remuneration of labor that have taken shape over the 20-year period under review and the changes that have occurred in them over that period are the result of improvement of the existing price system and also of the influence of other factors: the rise of labor productivity, higher profitability of the production of products, changes in the sectoral pattern of production, etc.

The figures given above on the ratio of net income to the fund for remuneration of labor characterize proportions in the stage of primary distribution of the national income. If we take into account that in the process of the further distribution and redistribution of income a portion of net income goes back to workers employed in the sphere of physical production and to members of their families in the form of pensions, benefits, free education, free medical care and other payments and benefits from social consumption funds, while at the same time the fund for remuneration of labor of workers employed in the sphere of physical production is subject to deductions for taxes, collections and other payments, the ratio between the portion of the net income of enterprises remaining after redistribution (i.e., after deduction of social consumption funds obtained by workers and members of their families, but with addition of the taxes and payments they paid) and the final income of the workers employed in the sphere of physical production (wage payments plus payments and benefits from social consumption funds minus taxes and other payments) will change considerably and will even amount to about 65 percent. The ratio of the rate of net income to the fund for remuneration of labor computed in this way reflects the rate of the surplus product in the stage of final use of the national income.

There have been a number of items in the economics literature containing proposals that the rate of the surplus product in a socialist economy be computed only in the stage of final use of the national income. The motive behind this proposal is that the necessary product in a socialist society cannot be confined solely to the fund for remuneration of labor, but should also include that portion which the workers receive from social consumption funds (pensions, benefits, scholarships, free education, free medical care, and so on). Certain economists propose that the necessary product include not the entire amount of payments and benefits, but only that portion related to expenditures for reproduction of manpower (i.e., not including expenditures to pay pensions, to train specialists with higher education, and so on).

Without contesting the need for such a calculation, which in the former case (when all social consumption funds are included in the necessary product)

essentially shows the ratio of accumulation and other statewide expenditures to the consumption of physical goods and services by the population,\* we at the same time consider it extremely indispensable and important to compute the rate of net income in the stage of primary distribution of the national income. It is otherwise impossible to thoroughly analyze the process of expanded socialist reproduction, the rate of net income cannot be studied for the individual branches of physical production, the optimality of the structure of the present price system cannot be studied, nor can one understand the processes of distribution and redistribution of the national income.

Intensification of the economy and its rising efficiency depend in large part on establishing optimum proportions and on adhering to the basic conditions for expanded socialist reproduction. As is well known, if the process of reproduction is to take place continuously and on an expanded basis, it is indispensable that the following conditions be observed: the newly added value of Department I ( $v + m$ ), and consequently also that portion of the social product which corresponds to it in physical composition, must be greater than the fund for reimbursement of the means of production of Department II (IIc). Correspondingly, the output of Department I ( $I_p$ ) must be greater than the sum of funds for reimbursement of means of production in both departments ( $I_c + II_c$ ), and the entire new value they have created, or the entire national income (ND), must be greater than the value of the output of Department II. It is very important here to determine the scale of that difference, and that not only with respect to the total amount, but also with respect to its physical makeup. The direction and scale of development of social production, the character and rates of reproduction, intensification of the economy and its higher efficiency depend on this.

The figures in Table 10 show that the volume of the net output of Department I exceeds the volume of material production costs of Department II computed from retrospective intersector balances and characterizing the resources or potential for carrying on expanded socialist reproduction.

Table 10

<u>Indicator</u>	<u>1959</u>	<u>1966</u>	<u>1972</u>	<u>1977</u>
Scale by which Department I exceeds Department II, or the potential for expanded reproduction:				
Billions of rubles	22.7	35.5	50.7	65.3
Relative to the net income of Department I, %	75.4	71.0	60.8	61.5

These figures characterize the first basic condition of expanded reproduction and show the scale by which the net output of Department I exceeds the material production costs of Department II. By that same sum the output of Department I exceeded the material production costs in both departments (the second condition of expanded reproduction), and the entire national income exceeded the output of Department I (the third condition of expanded reproduction).

\* It is proposed that such calculations be made within the limits of the sphere of physical production.

reproduction). The figures show that not all the net income of Department I is used for the purposes of expansion of production; a certain part of it goes to meet needs and the development of the nonproduction sphere. Over the period under consideration (1959-1977) there was an increase in the absolute size of resources used for expansion of production (2.9-fold). While there was a substantial increase in the total volume of the net income of Department I, there was a decrease in its share used for expansion of production and an increase in the share used to meet the needs of the nonproduction sphere.

Indicators of the growth of the national income and of the net income of Department I and its use for expansion of production and to satisfy the needs of the nonproduction sphere (in actual prices of the respective years) are given in Table 11.

Table 11

Indicator	1959	1966	1972	1977	In Percentage		
					1977 1959	1977 1966	1977 1972
National income produced--total, billions of rubles	136.2	207.4	313.6	403.0	296	194	129
Net income of Department I alone	30.1	50.0	83.2	106.2	353	212	128
Use of the latter:							
For expansion of produc- tion:							
Billions of rubles	22.7	35.5	50.7	65.3	288	184	129
Relative to net income, %	75.4	71.0	60.8	61.5	--	--	--
For satisfaction of the needs of the nonproduc- tion sphere:							
Billions of rubles	7.4	14.5	32.5	40.9	553	282	126
Relative to net income, %	24.6	29.0	39.2	38.5	--	--	--

As we see from Tables 10 and 11, over the period being studied important structural changes took place in the economy as to the distribution and use of the national income in the direction of augmentation of resources to raise the people's standard of living. All of this became possible because of the course conducted by the party and government toward intensification of the economy on the basis of higher labor productivity, a faster rate of scientific-technical progress and higher production efficiency.

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## INDUSTRIAL DEVELOPMENT AND PERFORMANCE

### ELECTRIC POWER AS A FACTOR IN DISTRIBUTING INDUSTRIAL PRODUCTION

Moscow PLANOVOYE KHOZYAYSTVO in Russian No 3, Mar 82 pp 56-62

[Article by V. Ryl'skiy, candidate of economic sciences, department chief of the Council for the Study of Productive Resources attached to GOSPLAN USSR: "Electric Power a Decisive Factor in Locating Industrial Production"]

[Text] Efficient development of the country's fuel and electric power complex plays an important role in the solution of major long-term national economic problems.

The role of the electric power industry and of electrification was substantiated theoretically in the GOELRO [State Commission for the Electrification of Russia] plan adopted by the 8th All-Russian Congress of Soviets. The plan reflects the principal technical and economic directions for the development of productive resources, in conjunction with the country's industrialization involving efficient location of both industrial production and the power system, in accordance with the material and manpower resources of the individual regions.

Already during the first years of the Soviet state, the party defined the basic role of the electric power industry within the general system of developing and locating the country's productive resources, and it outlined a program for economic growth based on electrification. It was noted in the GOELRO plan that "to draft a plan for the electrification of Russia means providing a red guiding thread for all creative economic activity, building the scaffolding for the realization of a unified state plan for the national economy."\*

Lenin's principles for the territorial development of productive resources, and the objectives of electrification substantiated by him are based on an analysis of the technical, economic and natural factors in their interaction, and they retain their basic importance even in the present stage of development.

The 26th CPSU Congress reemphasized the role of the fuel and electric power complex in raising the effectiveness of social production and in the solution of social problems as well. The congress focused attention on the unavoidability of pursuing a strict policy of energy conservation, of reducing the consumption volume of refined fuels, and of accelerating the development of nuclear power generation.

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\*"Plan elektrifikatsii RSFSR" (Plan for the Electrification of the RSFSR), Moscow, Gospolitizdat, 1955, p 32.



By 1985 the output of electric power in the Soviet Union is to reach 1550-1600 billion kilowatt-hours, and within this the share of nuclear power plants is to increase to 15 percent. As a separate large-scale problem, work is expected to unfold on producing synthetic fuel based on low-grade Siberian coal deposits and on intensifying petroleum refining.

The program for developing the fuel and electric power complex bears a clearly regional imprint. The bulk of the increases in the output of petroleum, natural gas and coal is to be supplied by the eastern regions; nuclear power will play an ever greater role in supplying the European regions with electricity.

The attention that the 26th CPSU Congress devoted to the fuel and electric power complex is explained by the complicated and contradictory conditions of the latter's development. The geographic noncoincidence of the centers of consumption and of the centers of extracting energy resources, and the stricter requirements regarding the structure of the sources of energy are making themselves felt increasingly.

The factors of fuel and electric power belong among the constantly functioning factors, and their effect intensifies in the solution of the problems of locating industrial production. Implementation of the principle of developing energy-intensive industries at an accelerated rate in the eastern part of the country has already resulted in that the eastern regions at present are producing a significant proportion of the output of nonferrous metallurgy and a number of other industrial sectors.

But in spite of this, the share of the country's eastern part in the gross output of industry is increasing at rates that, in our opinion, are inadequate if we take into consideration the favorable prerequisites here for the development of the fuel and electric power complex. For example, at the end of the current five-year plan when the eastern regions are to supply the bulk of the total output fuel, their share in the total consumption of fuel resources will be less than 28 percent.

The long-term regional parameters that are taking shape in the development of the economy's branches are not in accord with the existing prerequisites for the development of productive resources in the individual regions. Thus, in spite of the policy, which should be implemented consistently, of locating in Siberia industries that have a high energy intensity and a low labor intensity, the demand for manpower is growing at rates that are causing a growing deficit of this zone's manpower balance, which means that the costs of attracting, retaining and settling the manpower are increasing.

Even if no new energy-intensive industries are located in the European region, the problem of supplying customers with electric power in this zone through the end of the 20th century is regarded as one of the most complicated problems of forming the fuel and electric power complex. At present as well as long term, about two-thirds of the electricity and fuel produced in the country will be consumed here.

The rapid growth rates of electric power consumption in the European regions of the Soviet Union result in a sharp rise of the volume of sources of energy that must be transported here and also necessitate a large-scale program for the

construction of nuclear power plants. In the period 1971-1980 alone, deliveries of petroleum to the European regions increased more than 15-fold; deliveries of natural gas, fivefold; while deliveries of coal increased less than twofold.

At the emerging location of productive resources and main fuel bases, this approach to supplying the European regions with energy, coupled with the development of nuclear power plants, is the only practically feasible one. But it should be borne in mind that the country's fuel and electric power complex incurs additional transportation costs that each year amount to many billions of rubles.

It seems expedient to analyze the directions and sectoral structure of the growing demand for energy in the European regions. According to our estimates, for example, nonferrous metallurgy and the chemical industry will account for 17.3 percent of total energy consumption in the near future; and ferrous metallurgy and engineering, for 41.8 percent. These figures indicate that here the bulk of the increase in energy consumption will be in industries that are not energy intensive (although the situation in terms of their location is not entirely favorable), and at enterprises whose specific energy intensity is relatively low but whose absolute energy consumption is considerable in view of the scale of their production. This applies first of all to ferrous metallurgy and engineering that account at present, and will account also long term, for more than 40 percent of the total consumption of boiler and furnace fuel in the European regions. So far as the sectors of nonferrous metallurgy are concerned, their share of total energy consumption in the European regions is already now relatively low and cannot be regarded as the basic cause of the growing deficit of the fuel and electric power balance [budget in physical terms].

Despite the persistent trend of the chemical and petroleum refining industries' shift eastward, the share of these sectors within the total energy consumption in the European regions is about 13 to 14 percent. The high consumption of energy in these sectors is explained by the fact that in 1971-1980 the bulk of the increase in the output of chemicals and petrochemicals was achieved through the modernization and expansion of existing enterprises in the European regions. With the accelerated construction of chemical and petrochemical complexes in Siberia, long term we can expect changes in the territorial proportions of energy consumption in the mentioned sectors, in favor of the eastern part of the Soviet Union.

In our opinion, the present location of metallurgical and engineering production is not justified in terms of energy costs. In 1975, ferrous metallurgy in the European regions accounted for more than 87 percent of the total energy consumption within this sector. The situation basically did not change in 1980, and no significant changes can be expected even in the next decade. At the same time the growing demand for metallurgical and engineering products in the eastern part of the Soviet Union is being supplied to a large extent from the European regions. The concentration of metallurgical and engineering production in the European regions is one of the basic causes of the growing deficit in these regions' fuel and electric power balance and, in our opinion, it is also a factor that seriously impedes the development of productive resources in the eastern part of the Soviet Union.

It is typical that in the European part of the Soviet Union the bulk of the increase in energy consumption, including the aforementioned sectors, is located in the western and central regions where sources of energy are particularly expensive (Table 1). Most of the nuclear power plants being built in the Soviet Union are being placed in operation here, to supply the increasing demand for energy.

Table 1. Annual Growth Rates of the Consumption of Electric Power, Heat and Fuel for Direct Combustion, by Regions of the European Part of the Soviet Union (in Percent)

A - Industry jointly; B - Of which the surveyed industries (ferrous metallurgy, engineering, and building materials industry)

	1975		1980		1975-1980	
	A	B	A	B	A	B
Northern and central regions of the European USSR	28.15	23.40	29.15	24.33	36.33	30.70
Southern part of European USSR	40.60	46.50	46.20	39.70	40.30	47.35
Of which Ukrainian SSR	27.70	34.40	33.50	41.90	28.80	27.20

At the same time the role of nuclear power plants in reducing the consumption of sources of energy will be small over a longer period of time. The fuel saved by generating electricity in nuclear power plants in the European regions of the Soviet Union increased under the 10th Five-Year Plan from 8 million tons of standard fuel equivalent in 1975 to 25 million tons in 1980. During this same period the importation of fuel from the eastern regions into this zone increased by more than 300 million tons of standard fuel equivalent. Even with the accelerated construction of nuclear power plants, their share of the European regions' fuel and electric power balance will not exceed, according to the author's estimate, 5 to 7 percent by the end of the current five-year plan, and at the current trends in the location of social production the share of long-haul fuel may be around 50 percent in supplying the energy demand of these regions.

The evolving situation can be explained by the fact that over a fairly long period the nuclear power plants basically will be generating only electricity. However, the proportion of sources of energy used to generate electricity do not exceed at present the total volume of boiler and furnace fuel consumed. The rest of the fuel is used to generate heat (about 30 percent) in industry, construction and in the sector of municipal and consumer services. It may be estimated that for every ton of standard fuel equivalent used to generate electricity, 3 tons are consumed for generating thermal energy, in transportation, agriculture, and in the sector of municipal and consumer services. Thus the development of nuclear power generation to the cogeneration of heat and power (which will be feasible only at the end of this century) will reduce very slowly the European regions' dependence on fuel deliveries from the eastern zone.

Under the developing conditions the most specific direction for gradually changing the proportions of energy consumption is to perfect the territorial proportions of the development of social production, by moving to the eastern parts of the Soviet Union not only the enterprises that are energy intensive, but also

the ones whose energy requirement is only average. The fact that most of the industrially developed regions in the European part of the Soviet Union are beginning to experience water shortages lends support to this proposition. Specialists at present are studying in detail the feasibility of a costly program for diverting a proportion of the flow of the northern rivers into the Volga basin. Here a rise in the rates of developing industrial production is limited also by ecological factors and by the growing real difficulties in supplying manpower for the industrial enterprises. As the density of industrial development increases in the eastern regions and this territory becomes saturated with facilities comprising the social infrastructure, construction costs will decline and, consequently, the effectiveness will increase of locating here a number of capital-intensive and moderately labor-intensive industries.

The possible changes in the purposefulness and the impact of the prerequisites for, and the factors of, social production's development should be reflected in the methodological instructions for assessing the effectiveness of the location of industries. In particular, in the conditions for the intensification of production more attention must be devoted to the role that electrification plays in the rise of labor productivity and the reduction of labor intensity.

In analyzing solutions associated with substantiating the directions for perfecting the territorial proportions in the location of industries, the fact claims attention that the degree of the power industry's influence is practically always assessed on the basis of the electric power component's magnitude within the total additional costs of producing the specific type of output, i.e., on the basis of the cost of electricity. However, the sectoral computations in a number of instances disregard the regional prerequisites for electrification that reduces the expenditure of direct labor and permits a reallocation of manpower among the individual spheres of production; the lower costs of the social infrastructure as a direct function of the lower labor intensity; the improvement of working and living conditions; the abatement of environmental pollution, etc.

It can be said that up to now the degree of the electric power industry's influence on perfecting the territorial proportions in the location of industries, and on forming a rational structure of social production in the regions, has been evaluated from a sectoral viewpoint. In most cases the intersectoral effect of raising the level of technology and improving product quality, and the social and economic consequences of electrification are not taken into account.

Most of the complex problems associated with expanding the sphere of electric power consumption and assessing the impact of electrification on the effectiveness of social production in a region are not being studied adequately. And in a number of instances this leads to conflicts of interest between the development of a specific industrial sector and of the national economy on the given territory.

A rise in the level of the electrification of production and auxiliary processes should be regarded as one of the most important conditions in pursuing



a policy of saving labor and raising the effectiveness of production. This proposition, which reflects one of the characteristics of the national economy's long-range development, is of basic importance for accelerating industrial development in the regions of Siberia that are short of manpower. Here, more so than in any other region of the country, the use of electricity in most power and technological processes in industry is already now more economical than the use of other sources of energy (of petroleum products and natural gas in particular). In terms of the equivalent of one ton of standard fuel, electricity costs about two-thirds as much as natural gas in central Siberia (while in the European regions the ratio is the exact opposite).

Siberia's industrial potential is characterized already now by the highest availability of electrical equipment and highest electrical intensity, and consequently by a lower labor intensity. Basically this can be attributed to the fact that the proportion of energy-intensive industries located here is high. According to our computations, in 1980 the availability of electrical equipment per worker was 2.3 times higher than on average for industry in the Soviet Union, and the electrical intensity of industrial production was 2.1 times higher.

But at the same time, most manufacturing industries in Siberia (light industry, and the food, chemical and lumber industries) have the same availability of electrical equipment per worker as the average for Soviet industry. In view of the manpower shortages in the given regions, this indicates considerable reserves in pursuing a labor-saving policy based on a sharp expansion of the sphere of electric power's applications.

Emphasizing the national economic expediency and necessity of production's wide-scale electrification, practically all specialists note the complexity of its realization, from the viewpoint of organizing the output of the necessary volume of new equipment that has acceptable economic indicators, and also from the viewpoint of increasing the economic effectiveness of using electricity as compared with the other sources of energy.

The differences between regions in terms of energy costs and the availability of manpower favor to the largest possible extent a differentiated approach to the electrification of individual processes on a regional scale.

Under the present conditions when the party is pursuing a consistent policy of raising wages and the zonal ratios of electric power generation are relatively stable, it will be of interest to compare the development of the ratio of the cost per kilowatt-hour to the wages per man-hour (Table 2) in the Soviet Union as a whole and in the individual economic regions.

Even at the relatively high cost of electromechanical equipment and machinery needed to replace a blue-collar worker in auxiliary production (up to and over 5,000 rubles), specialized organizations estimate that the effectiveness of the electrical mechanization of auxiliary production is sufficiently high (the payoff period is estimated at 0.7 year). The ratios of electricity generating costs to annual average wages shown in Table 2 lead to the conclusion that the economic expediency of reducing the labor intensity of production varies in a territorial breakdown: the low generating costs and high wages



Table 2. Changes of the Ratio of Generating Cost per Kilowatt-Hour to Wage Costs per Man-Hour

	USSR average		Siberian average	
	1975	1980	1975	1980
Cost of electricity delivered to customer, kopeks/kWh	1.3	1.3	0.8	0.8
Annual average wage cost (based on 1800 hrs/year), kopeks/man-hour	97	114	136	159
Ratio of cost/kWh to wage cost per man-hour, percent	1.34	1.14	0.59	0.50
Quantity of electricity equivalent to annual average labor cost per man-hour, kWh	135	171	300	360

costs make a given process practically twice as effective in the regions of Siberia than in the European part of the Soviet Union. Many economists confirm these results. For example, Professor Ye. S. Rusanov estimates that electrical mechanization of manual labor in Siberia is 1.4 times more effective than in the European regions. In the computations the considerable differences between zones in the costs of attracting, retaining and settling workers were not taken into consideration. (The costs of moving a worker from the central regions to Siberia amount to several thousand rubles.) Inclusion of the additional costs under this item of expenditure makes electrification in the regions of Siberia even more effective.

As noted earlier, in the practice of economic computations the sectoral approach prevails, under which the expediency of using electric power is determined by the ratios of the costs of using different sources of energy and types of equipment in a specific production process. In our opinion, the effectiveness of the electrification of production processes should be determined not only at the sectoral level, but also at the intersectoral and interregional levels. This enables one not only to substantiate the expediency of increasing the level of electrification for specific production processes, but also to determine the territorial priorities in perfecting the technological and technical equipment of production, with due consideration for the regional prerequisites for accelerating technical progress, the possibilities of concentrating production capacities, and other factors.

The regions of the Soviet Union differ sharply in terms of the costs and use of energy and the availability of manpower, and hence also in terms of the costs of attracting, retaining and settling workers; in the conditions for the technical organization of production (the levels of concentration, specialization, etc.); in the level of the social and production infrastructure; in the state of the environment, etc. Specifically these differences determine the feasibility of "zoning" the location of new machinery and technology, with due consideration for the impact of the entire set of factors and conditions of a technical, economic and social nature.

Naturally the practice of determining the source of energy to be used, and the sectoral approach to assessing the technical and technological reequipping of

industries make it more difficult to implement a set of measures for raising the effectiveness of production when resources intended for a variety of uses are limited; they also hamper implementation of an energy-conservation policy and are not conducive to improving the proportions in the location of industries.

The advanced proposition to take more fully into account the regional prerequisites for electrification as a factor in perfecting the territorial proportions of the development of production cannot be fully realized within the framework of sectoral development programs, since this task concerns a number of intersectoral and interregional programs. The existence of law-conforming relationships between the level of production's electrification and its technical base, the growth of labor productivity and the implementation of a labor-saving policy, demands the expansion of intersectoral planning and the elaboration of a set of overall indicators with which it is possible to assess the national economic effectiveness of the measures to be adopted.

A realistic basis for extensive electrification of production and everyday processes in the eastern part of the Soviet Union, and in Siberia in particular, are the resource prerequisites for creating a powerful and highly economical electric power base. In forming the fuel and electric power complex in the eastern regions of the Soviet Union, three basic centers can be distinguished: western Siberia where the bulk of the increase in the output of petroleum and natural gas is concentrated; eastern Siberia that is developing on the basis of mining the steam coal in the Kansk-Achinsk coal basin and of harnessing the hydroelectric power of the rivers in the Angara-Yenisey basin; and north Kazakhstan on the basis of the Ekibastuz deposits of steam coal. The power system management of Central Asia utilizes the hydroelectric potential of the rivers of Tajikistan and Kirghizia, and also the petroleum and natural gas resources of Uzbekistan and Turkmenistan.

The western Siberian, eastern Siberian and north Kazakhstan fuel and electric power bases have become the foundation for the formation of the largest territorial production complexes in the Soviet Union. Western Siberia specializes in petroleum and natural gas production, the chemical and petrochemical industries, natural gas processing, and the lumber industry. The system of Angara-Yenisey complexes have energy-intensive specialization in nonferrous and ferrous metallurgy, petrochemicals, petroleum refining, and the lumber industry. The Pavlodar-Ekibastuz complex is likewise energy intensive.

Specifically these fuel and electric power regions are to supply energy for customers in the European zone of the Soviet Union. The northern part of western Siberia is to produce 385 to 395 million tons of petroleum and 330 to 370 billion cubic meters of natural gas in 1985, and a significant proportion of this output is to be transported to the European regions of the Soviet Union. Under the 11th Five-Year Plan, construction will continue of the 1500-kV Ekibastuz-Center direct-current transmission line, over which the Ekibastuz state regional power plants will supply up to 40 billion kWh of electricity.

If developed at an accelerated rate, the fuel and electric power complex of eastern Siberia will supply with electricity not only the Angara-Yenisey industrial complexes, but also the zone of the Baykal-Amur trunk line, western Siberia and Central Asia.

In the long run it will be possible to supply electricity to the European regions over extra-high voltage transmission lines. Extensive work is in progress on the preparation of Kansk-Achinsk steam coal, to ensure its high effectiveness even when it is transported over long hauls (up to the European regions).

When the electric power centers within the system of the listed complexes are fully developed, the combined total generating capacity of their thermal power plants could exceed 100 to 120 kW. This will permit supplying the national economy in the eastern regions with over 700 billion kWh of the cheapest electricity in the Soviet Union. (In 1980, the total output of electricity in the eastern regions was less than 400 billion kWh.)

The Kansk-Achinsk fuel and electric power complex (KATEK) is to be the largest in central Siberia in terms of the parameters of its development. In the zone of the Kansk-Achinsk coal basin, the potential reserves of which are estimated at 247 billion tons, it will be possible to build 10 to 12 condensing electric power plants with a combined generating capacity of 90 million kW. The fuel and electric power resources are earmarked for use in the Siberian zone, to ensure a reliable electric power base for the expansion of industrial production in this zone; for the supply of fuel and electric power outside Siberia, primarily to the European zone; and for developing the technological conversion of coal into energy.

In spite of the extremely favorable resource prerequisites, the role of the state regional power plants within the Kansk-Achinsk fuel and electric power complex is relatively small in the fuel and electric power balance of Siberia. The hydroelectric power plants of the Angara-Yenisey basin play a much greater role; their installed generating capacity now exceeds 50 percent of the combined total base-load generating capacity in central Siberia. The industrial complex that is being formed here will require a large quantity of base-load electricity that can be generated only in the powerful condensing power plants of the Kansk-Achinsk fuel and electric power complex. It must also be taken into consideration that the Kansk-Achinsk complex is the basic reserve coal basin of the Soviet Union.

Considering the long construction time of the facilities of the fuel and electric power complex and the region-forming role of the Kansk-Achinsk complex, it is necessary to accelerate already in the next few years the installation of the strip mines and electric power plants, after establishing a sound relationship between the growth rates of Angara-Yenisey cascade's hydroelectric power plants and of the powdered-coal-fired state regional power plants. It is also necessary to accelerate the preparation of this coal, the technological conversion of coal into energy, and the creation in central Siberia on this basis of enterprises for the production of synthetic petroleum, synthetic engine fuel, and feedstock for the chemical industry.

The arguments presented above lead to the conclusion that--despite the considerable successes in developing the fuel and electric power complex of the Soviet Union--there are prerequisites for further increasing the effectiveness of its operation, by consistently moving to the east the consumers of fuel and electric power. The growth of electric power consumption in the east can be

ensured by locating here not only the energy-intensive industries, but also the manufacturing enterprises of average energy intensity whose labor intensity must be reduced by implementing the labor-saving policy that is reflected in higher levels of electrification, and of the automation and mechanization of all production processes.

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